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Physical Activity and Cardiometabolic Risk Factors among African American Women
residing in the Southeastern United States

Felicia Jenkins

A dissertation submitted to the faculty of the Medical University of South Carolina in
partial fulfillment of the requirements for the degree of Doctor of Philosophy in the
College of Graduate Studies

April 22nd, 2016

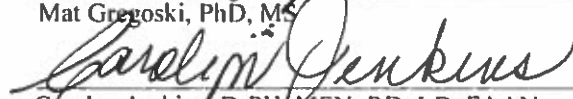
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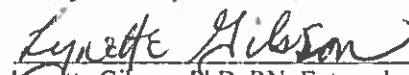
Gayenell S. Magwood, PhD, RN, Chair



Mat Gregoski, PhD, MS



Carolyn Jenkins, DrPH, MSN, RD, LD, FAAN



Lynette Gibson, PhD, RN, External member

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Abstract

Cardiometabolic risk (CMR) refers to an increased risk of developing cardiovascular disease (CVD) or diabetes, two of the leading causes of death in the United States. CMR factors include elevated glucose, blood pressure, and lipids. Lifestyle factors including physical inactivity, smoking, and poor dietary habits such as low fruit/vegetable consumption also contribute to CMR. Notably, African American women (AAW) have a high rate for several CMR factors including obesity, physical inactivity, and hypertension. Furthermore, AAW are an understudied population in research focusing on PA health promotion and studies examining PA associations with CMR. The aims of this dissertation study were to examine PA and CMR among AAW. Manuscript one is an integrative review focusing on PA intervention strategies among AAW. This dissertation compendium also consists of two studies that focus on PA and CMR among AAW. Manuscript two details a secondary data analysis of REACH Risk Factor survey data from two coastal communities in South Carolina. Manuscript three examines the feasibility, acceptability, and implementation of community-based screening with the use of a modified REACH Risk Factor survey. The third manuscript also examines PA and CMR in a geographic region not covered by REACH survey data. The findings of this dissertation (a) revealed low rates of AAW meeting recommendations for PA and fruit/vegetable consumption, (b) demonstrated the feasibility of CMR screenings using a modified REACH Risk Factor survey, (c) revealed the need for further CMR screening research with a larger sample size.

Key words: Cardiometabolic risk, African American, women, physical activity

Introduction

Cardiometabolic risk (CMR) is the likelihood of an individual developing chronic health conditions such as diabetes and cardiovascular disease (CVD). Cardiovascular disease and other chronic health conditions, such as diabetes, are leading causes of mortality. Cardiovascular disease is associated with CMR factors such as hypertension, obesity, and hyperlipidemia (R. E. Lee, Mama, & Lopez Iii, 2012). In the U.S., an estimated 610,000 people die from CVD every year (Centers for Disease Control and Prevention, 2015). African American women (AAW) have a higher rate of hypertension and a higher mortality rate from CVD and diabetes when compared to Non-Hispanic White women (Office of Minority Health [OMH], 2016). Additional CMR factors include lifestyle factors such as smoking, physical inactivity, and unhealthy eating habits. Unhealthy eating habits, such as a diet that is not rich in fruits and vegetables, contribute to chronic health conditions. Lifestyle behaviors such as a healthy diet are important for chronic disease prevention (August & Sorkin, 2010).

In addition to health disparities for chronic health conditions, AAW have high rates of obesity and physical inactivity, risk factors associated with these chronic health conditions. AAW are 80% more likely to be obese than non-Hispanic White women (OMH, 2013). According to an analysis of 2009 data for Charleston and Georgetown counties, 48.9% of AAW were obese compared to 30.8% of African American men (Liao et al., 2011). Like obesity, physical inactivity contributes to morbidity and mortality. Lifestyle behaviors, such as physical activity (PA), are essential for health promotion and disease prevention. Although Healthy People 2020 indicates that more than 80% of U.S. adults do not meet PA guidelines, AAW have a higher rate of physical inactivity when compared to other gender/ethnic groups (Go et al., 2014; S. H. Lee & Im, 2010). Previous studies have reported inconsistent findings regarding PA's influence on CMR. Several studies have reported significant results (Carr et al., 2008;

Wilson, Porter, Parker, & Kilpatrick, 2005; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001; Young et al., 2014). Young et al. (2014) examined associations between PA and CMR factors and identified significant differences in blood pressure and glucose levels for active and inactive women. Women who were consistently active had lower systolic and diastolic blood pressure and lower fasting and random glucose when compared to inactive women. Nonsignificant findings for PA and CMR factors have been reported as well (Keyserling et al., 2002; Peterson, Snih, Stoddard, McClain, & Lee, 2014; Stephens, Kirby, Buckworth, Devor, & Hamlin, 2007; Wilder, Grandjean, Schuessler, & Hendricks, 2011). Yet studies examining the association of PA and CMR have either not included AAW (Carr et al., 2008) or included AAW without reporting results by race (Peterson et al., 2014; Young et al., 2014). To help address the research gap, this dissertation examines PA and CMR levels and the association of PA and CMR among AAW.

Design and Method

This dissertation consists of two studies that focus on CMR and PA among AAW. The first study is a secondary data analysis of 2001 – 2012 Racial and Ethnic Approaches to Community Health (REACH) 2010 and REACH US Risk Factor survey data. This secondary analysis examines three variables:

1. Physical activity levels of a sample of AAW (n = 4,160) living in two counties in the southeastern US.
2. Whether an association exists between level of physical activity and CMR factors including hypertension, hyperlipidemia, obesity, and diabetes.
3. Additional lifestyle factors including smoking and fruit and vegetable consumption.

In the analysis, AAW who responded to moderate or vigorous intensity PA survey items were included. New data sets that adhered to the eligibility criteria were created for each year

and then combined into one dataset. This secondary analysis received exempt status from the Medical University of South Carolina Institutional Review Board.

This dissertation also includes a feasibility study to examine PA and CMR levels among AAW and the use of a modified version of the REACH Risk Factor survey in a geographic region not covered by REACH. Also evaluated are the acceptability and implementation of community-based screening and its linkage to follow-up primary care. Following Institutional Review Board approval of this feasibility study at the Medical University of South Carolina (MUSC), a convenience sample of 32 AAW attending community health screenings was recruited. African American women agreeing to participate completed the informed consent process.

Key Concepts

PA refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2016). Current PA guidelines advise 30 minutes of moderate-intensity aerobic activity at least 5 days per week or 25 minutes of vigorous-intensity aerobic activity at least 3 days per week in addition to at least two days of strength-conditioning (American Heart Association, 2015a). Physical activity intensity level is often measured using metabolic equivalents (METs). METs refer to the energy expended while the body is resting (Bushman & American College of Sports Medicine, 2015). METs are used to express the energy expenditure of an activity. Intensity levels are categorized as light, moderate, and vigorous. Light-intensity refers to activities that do not increase heart rate, with intensity levels below 3.0 METs (example: walking at a casual pace). Moderate-intensity refers to activities that cause a slight to moderate increase in breathing or heart rate (example: brisk walking), and vigorous-intensity refers to activities that cause a large increase in breathing or heart rate with greater than 6.0 METs (example: running). It is important to note that intensity

level may vary based on an individual's fitness level. For example, brisk walking may be moderate-intensity for a healthy adult, while a casual walk may be moderate-intensity for an unfit individual (Aadahl, Kjaer, & Jørgensen, 2007).

The secondary analysis and feasibility study include self-reported data for diabetes, hypertension, and hyperlipidemia. Elevated blood glucose refers to the patient self-reporting a history of diabetes. Hypertension refers to a self-reported history of high blood pressure. Hyperlipidemia refers to a self-reported history of high cholesterol. Weight and height were self-reported by participants. To obtain data regarding obesity, the investigator used the Centers for Disease Control and Prevention (2011) recommended calculation for BMI: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$. BMI is reported as normal weight, overweight, and obese. Smoking status and consumption of fruits and vegetables are self-reported as well.

Objective measures obtained from health screening records include blood pressure, fasting (capillary) blood glucose, A1C, height, weight, waist circumference, BMI, blood lipids, and urine microalbumin. The specific CMR factors or variables include hypertension, obesity, increased glucose, and hyperlipidemia. Hypertension, or elevated blood pressure, refers to a systolic blood pressure of 140 mm/Hg or higher or a diastolic blood pressure of 90 mm/Hg or higher (American Heart Association, 2015c). Glucose was measured using a capillary blood sample for a fasting glucose; an A1C test was used to measure the average blood glucose for the previous 2-3 months. Elevated blood glucose refers to a fasting blood glucose $\geq 100\text{mg/dl}$, a random blood glucose $\geq 140\text{ mg/dl}$, or an A1C $> 5.7\%$ (American Diabetes Association, 2015). The Centers for Disease Control and Prevention guidelines for overweight and obesity are used. Overweight is a BMI of 25.0 to 29.9, and obesity refers to a BMI of 30 or higher (Centers for Disease Control and Prevention, 2012). An increased waist circumference refers to measures greater than 35cm (measured at the umbilicus) for women. Blood lipids (cholesterol) include

total cholesterol, low-density lipoproteins (LDL), high-density lipoproteins (HDL), and triglycerides. Hyperlipidemia refers to elevated lipids (cholesterol and triglyceride levels). Elevated total cholesterol refers to levels ≥ 200 mg/dl, elevated LDL refers to levels ≥ 190 mg/dl (≥ 70 mg/dl for persons with a history of heart disease), and elevated triglycerides refer to levels ≥ 150 mg/dl (American Heart Association, 2015b; Stone et al., 2013). The recommended HDL cholesterol for women is ≥ 50 mg/dl. Elevated urine microalbumin refers to levels ≥ 30 mg/L.

Theoretical Model

This dissertation study relies on Pender's Health Promotion Model (HPM), which examines health-promoting behavior (Sakraida, 2014). Based on the HPM, PA is considered a health-promoting behavior. Health-promoting behaviors refer to action outcomes that are focused on positive health outcomes (Sakraida, 2014). According to the HPM, personal factors are categorized as biological, psychological, and sociocultural. This study examined biological factors (i.e. weight, BMI, etc.). This study also examined PA levels among AAW and the relationship of PA levels and specific factors including 1) blood glucose, 2) weight (BMI), 3) blood pressure, and 4) blood lipids. Further, this study examined lifestyle factors including smoking status and fruit and vegetable consumption. These lifestyle factors (i.e. consuming fruits/vegetables and not smoking) are also health-promoting behaviors. Several studies have used the HPM as a framework for promoting health or examining health-promoting behaviors of African Americans (Edmonds, 2010; Johnson, 2005; Newell-Withrow, 2000). Further, the HPM has been utilized to promote PA among AAW (Anderson & Pullen, 2013). The REACH Risk Factor survey used in this study includes items that examine health-promoting behaviors such as PA, smoking history, fruit and vegetable consumption, and last routine checkup. These items are similar to items included on the Healthy Lifestyles Profile II, a commonly used scale for examining health-promoting behaviors.

Manuscripts

Manuscript one is an integrative review that examined strategies used in PA interventions focusing on AAW. The integrative review revealed a dearth of research examining PA interventions in AAW. Although the number of studies focusing on AAW has increased, there is still a need for further research promoting PA in AAW. Additional research specifically focusing on increasing PA in older AAW is warranted. The integrative review also supports the need for additional research examining the association of PA and CMR factors among AAW.

Manuscript two is a secondary analysis of the REACH US Risk Factor Survey. Survey data included AAW living in two southern communities. The secondary analysis examined PA levels from 2001 to 2012 among a sample of AAW. Physical activity levels included moderate-intensity and vigorous-intensity PA. Further, the secondary analysis examined the association between PA level and CMR factors. Participants self-reported PA and CMR factors including weight (body mass index) and a history of diabetes, hypertension, and hyperlipidemia.

Manuscript three discusses the results of a feasibility study that examined PA levels and CMR factors for a sample of AAW. CMR factors included subjective and objective data. Objective data included glucose, lipids, weight, BMI, waist circumference, blood pressure, and urine microalbumin. Additional examined factors included fruit and vegetable consumption, smoking status, and self-reported history of hypertension, hyperlipidemia, and diabetes. Further, the study examined the feasibility, acceptability, and implementation of community-based screening. Findings from this dissertation will be used for future studies examining PA level and CMR among AAW. The need to decrease health disparities associated with physical inactivity and CMR factors is a significant public health concern in the US. Research focusing on AAW, a population where additional research is needed, will add to the current state of science.

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Manuscript I: Interventions Promoting Physical Activity in African American Women: An Integrative Review (Published)



Interventions Promoting Physical Activity in African American Women

An Integrative Review

Felicia Jenkins, MSN, RN; Carolyn Jenkins, DrPH, APRN, RD, LD, FAAN;
Mathew J. Gregoski, PhD, MS; Gayenell S. Magwood, PhD, RN

Background: Physical inactivity significantly impacts mortality worldwide. Physical inactivity is a modifiable risk factor for obesity, diabetes, cardiovascular disease, and other chronic conditions. African American women in the United States have the highest rates of physical inactivity when compared with other gender/ethnic groups.¹ A paucity of research promoting physical activity (PA) in African American women has been previously identified. The purpose of this review was to identify intervention strategies and outcomes in studies designed to promote PA in African American women. **Methods:** Interventions that promoted PA in African American women published between 2000 and May 2015 were included. A comprehensive search of the literature was performed in Health Source: Nursing/Academic Edition, PsycINFO, CINAHL Complete, and MEDLINE Complete databases. Data were abstracted and synthesized to examine interventions, study designs, theoretical frameworks, and measures of PA. **Results:** Mixed findings (both significant and nonsignificant) were identified. Interventions included faith-based, group-based, and individually focused programs. All studies (n = 32) included measures of PA; among the studies, self-report was the predominant method for obtaining information. Half of the 32 studies focused on PA, and the remaining studies focused on PA and nutrition. Most studies reported an increase in PA or adherence to PA. This review reveals promising strategies for promoting PA. **Conclusions:** Future studies should include long-term follow-up, larger sample sizes, and objective measures of PA. Additional research promoting PA in African American women is warranted, particularly in studies that focus on increasing PA in older African American women.

KEY WORDS: African American, intervention studies, physical activity, women

Physical inactivity is a leading risk factor for mortality worldwide.² Physical inactivity is associated with heart disease and other chronic health conditions.¹ According to the World Health Organization,² 1 in 3 adults worldwide are physically inactive. Physical activity is defined as “any bodily movement produced by skeletal muscles that requires energy expenditure.”²

Healthy People 2020 estimated that more than 80% of adults in the United States do not meet the minimal recommended Centers for Disease Control PA guidelines³ (ie, recommendation of 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity each week, plus strength conditioning at least twice per week).^{4,5} For example, in an analysis of stroke and

Felicia Jenkins, MSN, RN

Doctoral Student, College of Nursing, Medical University of South Carolina, Charleston; Senior Instructor, University of South Carolina Upstate, Spartanburg.

Carolyn Jenkins, DrPH, APRN, RD, LD, FAAN

Professor, College of Nursing, Medical University of South Carolina, Charleston.

Mathew J. Gregoski, PhD, MS

Assistant Professor, College of Nursing, Medical University of South Carolina, Charleston.

Gayenell S. Magwood, PhD, RN

Associate Professor, College of Nursing and Chair, Department of Nursing, Medical University of South Carolina, Charleston.

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Correspondence

Felicia Jenkins, MSN, RN, College of Nursing, Medical University of South Carolina, 99 Jonathan Lucas St, Charleston, SC 29425 (jenkinf@musc.edu).

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heart disease statistics reported in 2011, an estimated 24.5% of US adults met the muscle-strengthening criteria, and 21.0% met both the muscle-strengthening and aerobic criteria.¹ Increasing the proportion of adults who meet federal PA guidelines is 1 of the *Healthy People 2020*'s established objectives. Physical activity is essential to health promotion and decreases risk for various conditions, including but not limited to heart disease, stroke, and diabetes.^{4,5} In addition to reducing the risk of heart disease, meeting PA guidelines has been associated with lowering the risk of hypertension and hyperlipidemia.^{1,4}

Heart disease is the leading cause of death for African American women.^{6,7} African American women have a higher rate of risk factors associated with heart disease, including hypertension, physical inactivity, and obesity. African American women have the lowest rate of exercise and leisure time PA.⁸ Among African American women, 35.5% meet PA guidelines, compared with 50.9% for non-Hispanic white women, 47.5% for African American men, and 56.4% for non-Hispanic white men.¹ According to data collected in 2011 by the US Department of Health and Human Services, African American women were 80% more likely to be obese than non-Hispanic white women.⁹ African American women had an obesity rate of 54.0%, compared with 38.3% for non-Hispanic black men and 32.5% for non-Hispanic white women.⁹ The American Heart Association/American College of Cardiology Guideline on Lifestyle Management to Reduce Cardiovascular Risk⁵ suggests additional research is needed to determine strategies for effectively implementing evidence-based recommendations to improve cardiovascular health. Additional research is warranted to increase understanding of racial/ethnic/socioeconomic factors that may act as barriers and prevent adoption of PA recommendations.⁵ Healthcare providers, including cardiovascular nurses, can be actively involved in determining strategies to implement recommendations and promote adoption of PA recommendations. Promoting PA in African American women is an essential factor in reducing the risk of heart disease and other chronic health conditions. Therefore, it is important to understand which intervention strategies are most effective when promoting PA among African American women.

This integrative review examines intervention studies published between 2000 and May 2015 that promote PA among African American women. It is important to note this review includes studies completed after the review by Banks-Wallace and Conn,¹⁰ which examined 18 studies from 1984 to 2000; 7 specifically focused on African American women.¹⁰ Because of the paucity of research at the time, Banks-Wallace and Conn¹⁰ included studies that consisted of a sample of at least 35% African American women. The current review includes studies specifically focusing on African American women or studies reporting results separately for African American

women. Race, ethnicity, and gender should be a central focus when developing and implementing effective PA interventions among specific populations; the inclusion of additional population subgroups other than African American women may unknowingly reduce the generalizability of results.^{8,11}

Methods

The purpose of this review is to identify intervention strategies and outcomes in studies designed to promote PA specific to African American women. As a result, interventions that solely focused on African American women or that reported findings separately for African American women were included. In addition, only intervention studies with direct measures of PA were included. Direct measures of PA included questionnaires, self-reporting, and objective measures such as pedometers and accelerometers. As recommended by Whittemore and Knafl,¹² 5 stages of review were completed: problem identification, literature search, data evaluation, data analysis, and presentation.

Problem Identification

Studies that met the following criteria were included in the search: (1) English language, (2) reported measures of PA in African American women, (3) published between January 2000 and May 2015, and (4) sample consisted of African American women only, or results were reported separately for African American women. Excluded were studies that did not report PA results by race and gender, as well as abstracts, and dissertations.

Literature Search

A literature search¹² occurred in PsycINFO, Health Source: Nursing/Academic Edition, CINAHL Complete, and MEDLINE Complete electronic databases for studies published from January 2000 to May 2015. The following search terms were included: "physical activity" or "motor activity" or "exercise" and "African American" or "black" and "women" and "intervention."

Data Evaluation

After abstracts were screened for duplicate studies and relevance, 32 articles were included in the review. The Figure provides a description of the search outcome. Studies included in this review were appraised using the Centre for Evidence-Based Medicine criteria, and the appraisal is shown in the Table, Supplemental Digital Content 1, <http://links.lww.com/JCN/A18>. The Centre for Evidence-Based Medicine provides a framework for assessing the level of evidence.¹³ The majority of the selected studies were randomized controlled trials.¹⁴⁻²⁷ After reviewing CONSORT (Consolidated Standards of Reporting Trials),²⁸ the investigator determined that most of those randomized controlled trials adhered to the CONSORT reporting guidelines (60%). The most

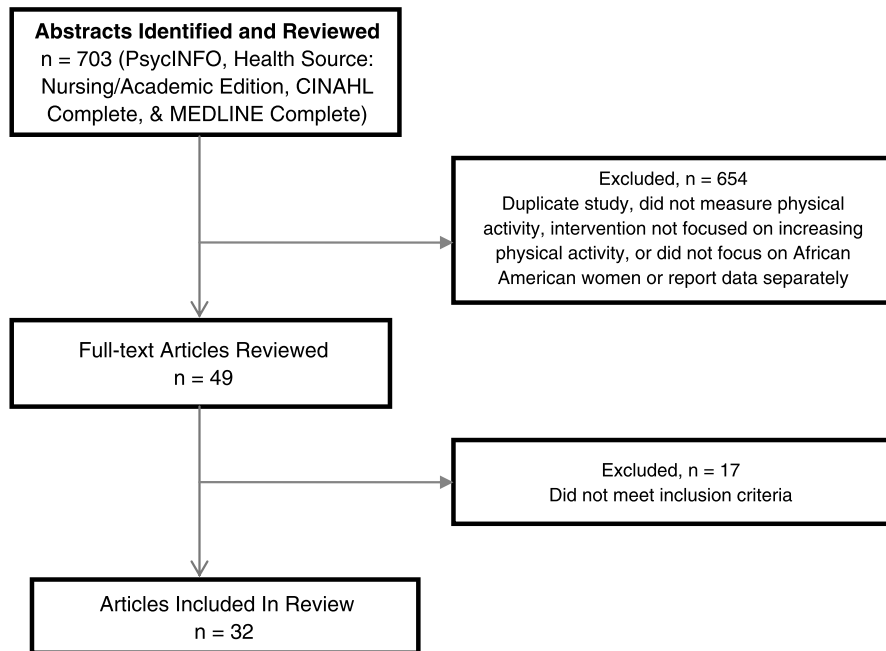


FIGURE. Literature search results.

common omission was identification of the study as a randomized trial in the title.^{17,18,22,23,25–27}

Data Analysis and Presentation

Studies included in this review are presented in the Table, Supplemental Digital Content 1, <http://links.lww.com/JCN/A18>, with the following column headings: purpose, design, intervention, theoretical framework, sample/location, physical activity (PA) measure, PA outcomes, and strengths/limitations.

Results

Results identified in this review include significant and nonsignificant changes in PA. Thirty-one studies focused solely on African American women. One study included non-Hispanic white and African American women, with results reported separately for each racial group.²⁹

Sample Description

The patient populations across the studies were heterogeneous and included low-income women,³⁰ postpartum,³¹ pregnant,³² breast cancer survivors,^{33–35} type 2 diabetes,¹⁹ mobility disabilities,³⁶ and women with high-normal or untreated stage 1 hypertension.²² Common inclusion criteria included overweight or obesity^{15,18,23,32,34,37} and sedentary.^{16,22,29,31,33,36,38–40} Few studies focused on women who were 40 years or older^{19,25} and 60 years or older.^{14,16}

Theoretical Framework

Twenty-two of the 32 studies included in this review relied on a theoretical framework,^{11,14–17,20,21,23–27,29,34,35,37,39–42} with all reporting significant or mixed results, with

the exception of 2 studies reporting nonsignificant changes in PA.^{25,26} The most commonly used theory identified was the Social Cognitive Theory, either used alone^{16,17,23,26,27,30,32,37,43} or in combination with another theory.^{11,20,21,34,42} Several studies did not report using a theory-based intervention; however, significant changes in results were reported including an increase in total minutes of PA,^{33,36,45} increase in steps per day,^{31,38} and self-reported energy expenditure.²² Several concepts identified in the intervention strategies included goal setting,^{11,14–16,20,22,26,32,33,36,39,40,42} reinforcement,^{16,32} and problem solving.^{15,22,32,35,36,44,47} Self-monitoring of PA^{15,22,32,37,42} and PA barriers^{15,36} were identified as intervention strategies. Notably, both theoretical and atheoretical studies reported significant and mixed results.

Intervention Strategies

Intervention strategies included culturally tailored interventions, faith-based interventions, group-based programs, and individually tailored programs. Furthermore, strategies included face-to-face sessions, telephone sessions, a combination of face-to-face and telephone sessions, and peer support.

As in the previous review by Banks-Wallace and Conn,¹⁰ several studies described culturally tailored interventions. Culturally tailored interventions will refer to studies that tailored the intervention to African American women. Many studies^{11,15,17,19–21,23,24,37,40,41,43,44} reported culturally tailored interventions cited in prior research or focus group findings that were incorporated into the design of the intervention strategies. Several studies were led by ethnically matched individuals.^{25,26,32,39,43,44}

Additional culturally tailored strategies identified include adapting educational materials and sessions for African American women, choice of location,^{43,44} and social support.^{15,26,39,43,44} Across studies using a culturally tailored intervention, significant results,^{11,19–21,43} mixed results,^{17,24,40–42} and nonsignificant results^{15,37} were reported.

Faith-based settings are commonly used as research intervention delivery sites.¹⁰ However, similar to the previous review by Banks-Wallace and Conn,¹⁰ few faith-based studies were found. Three studies^{26,43,45} were conducted in faith settings; however, these studies did not include a faith intervention. Studies conducted in a faith setting reported significant,⁴³ nonsignificant,²⁶ and mixed⁴⁵ results. Five studies^{14,16,25,27,39} were faith-based interventions. Faith-based intervention strategies included health information messages that were relayed by the pastor,²⁵ faith community nurse,¹⁴ prayers,^{14,16,25} Bible messages on holistic wellness,³⁹ and Bible scriptures.^{14,16,25,27} Faith-based intervention studies reported results that were mixed^{14,16,39} and nonsignificant.^{25,27}

The majority of the studies included an educational or instructional component. Several studies^{16–18,21,25–27,34,38,39,43–45} included group exercise sessions. This review revealed that several studies included a group meeting or educational session.^{11,16–18,19,21,25–27,32,34,38–40,43,45} Across home-based^{18,29,33,40,42} and telephone-based³⁶ studies, significant and nonsignificant results were reported. Another strategy identified were phone calls from a peer counselor or research staff member.^{18,19,31–33,36,40,45} Motivational interviewing was used as a strategy in several studies.^{15,20,33,36} Peer support was a component of several intervention strategies by including a walking or exercise partner.^{21,26,31,38} The Table, Supplemental Digital Content 1, <http://links.lww.com/JCN/A18>, provides additional information regarding PA interventions. The Table includes strategies from selected studies that reported significant changes in PA.

Physical Activity Measures

Physical activity measures included self-report, pedometers, accelerometers, heart rate monitors, and an armband with accelerometer and galvanic skin response (ie, SenseWear). The most common objective measures were pedometers^{16,31,35,38} and accelerometers.^{19,33,37,39,43} Nine studies included both objective and self-report measurements.^{16,24,26,33,37,39,40–42} This review revealed that self-report measures of PA are more commonly used, with only 14 of the 32 studies using an objective measure. The majority of studies using an objective measure reported significant results. Although self-report measures provided significant and nonsignificant results, future studies using self-report measures should include an objective measure as well. For example, a faith-based, pilot study³⁹ reported significant, self-reported results, although an objective measure provided

nonsignificant results. The Table, Supplemental Digital Content 1, <http://links.lww.com/JCN/A18>, provides information regarding the various self-report measurements.

Physical Activity Outcomes

The majority of the studies did not include a follow-up period or measure outcomes beyond the intervention. Of the 32 studies, 28 reported significant results in at least 1 outcome. Although several studies reported significant results for 1 measure, nonsignificant results for another measure were reported. This finding is similar to the previous review,¹⁰ with mixed results of interventions promoting PA in African American women. Significant results were reported for muscle-strengthening activities,¹⁴ 6-minute walk test,¹⁴ steps,^{16,30,31,34} total minutes of PA,^{32,35,39} changes in PA,^{16,19,21} time spent in PA,^{32,36,39} and time spent in leisure time PA²⁰ and vigorous activity.³⁴ Other studies reported nonsignificant results for overall PA hours per week,¹⁶ moderate to vigorous activity,¹⁸ PA intensity,³⁹ and walking intensity.⁴⁰ Total daily expenditure of energy was significant for 2 studies^{22,32} and nonsignificant for 2 studies.^{14,25} Although weight loss was not the focus of this review, studies reported significant weight loss (based on body mass index [BMI] and/or weight)^{23–25,31,34,35,43} and nonsignificant difference in weight.^{16,18,33} This review reveals mixed findings for changes in PA, with several studies indicating significant changes and other studies reporting nonsignificant findings. The Table provides additional information for measures and outcomes in this integrative review.

Discussion

Increasing PA is important for all populations; however, intervention strategies that promote PA in African American women are essential because African American women have the highest rate for physical inactivity and obesity in the United States. Increasing PA in African American women is a crucial component to reducing the prevalence of chronic health conditions. This review provides insight into the current state of the science focusing on intervention strategies that promote PA in African American women.

Older adults are more likely to not meet PA guidelines when compared with younger adults.^{4,46} In a 2011 report,⁴⁶ only 15.9% of older adults (≥65 years) met aerobic and muscle-strengthening guidelines. Older African American women tend to have a lower level of PA.^{14,16} Most studies promoting PA in African American women have primarily focused on young and middle-aged women.¹⁰ This review revealed a dearth of PA interventions focusing on older African American women. Several studies included age ranges that included women through age 65 or 70 years; however, only 2 studies^{14,16} specifically focused on women 60 years

TABLE Selected Intervention Strategies Providing Significant Increases in Physical Activity

Intervention Strategy	
Theory based	Included Social Cognitive Theory (SCT) concepts—intervention group received six 1-h toolbox classes (1 session/wk) focusing on fruit/vegetable consumption and physical activity ³⁰ 8-wk Community-based walking program (75-min sessions at community center in evening and church around noon) based on the Health Belief Model Sessions included didactic, interactive, and small group processes ³⁵
Culturally tailored	24-wk Intervention (12 wk per phase)—sessions included 1 h of physical activity and 1½-h nutrition education, cooking demonstrations, and social support—culturally tailored intervention included ethnically matched program staff, peer leaders/health coordinators recruited from each church, and the intervention was held in a church setting ⁴³ 6-mo Weight loss program focused on nutrition and physical activity; weekly group meetings and supervised exercise sessions at a local community center—culturally tailored intervention included the following: participants chose the location and format of exercise sessions; participants chose the content of group meetings, ethnically matched program staff, and social support; and group participants shared low-fat meals prepared by participants (participants also discussed how they reduced fat content for each meal) ⁴⁴
Theory based and culturally tailored	Culture- and gender-specific intervention based on Transtheoretical Model (TTM), SCT, and the Person, Extended Family, Neighborhood model. Facilitators led small groups that met for 90 min weekly for 10 wk. Majority of facilitators were African American women. Goals were set related to nutrition, physical activity, and stress management. Participants received a textbook and curriculum workbook. Comparison group received a copy of the textbook provided to the intervention group. Diabetes intervention program “New Life... Choices for Healthy Living With Diabetes” focused on nutrition, physical activity, and self-care behaviors and based on the TTM and SCT. Clinic-based intervention consisted of 4 clinic visits. Community-based intervention consisted of 12 telephone contacts with a community diabetes advisor and 3 group sessions. Three groups: group A—clinic and community based, group B—clinic intervention only, and group C—minimal intervention (were mailed pamphlets published by the American Diabetes Association) African American women with type 2 diabetes participated in focus groups to evaluate cultural aspects of the program ¹⁹ Theory-based (SCT) nutrition and physical activity behavior intervention included individual counseling session followed by eight 90-min group sessions. Telephone counseling contacts continued through 36-wk gestation. Postpartum: participants received home visit and up to 3 counseling calls. Culturally tailored—group sessions co-led by African American research staff member Culturally tailored, theory-based (TTM and SCT) intervention included telephone calls and printed materials that addressed topics of concern for African American women. Intervention also included 12 motivational, stage-matched ethnically tailored newsletters and up to 14 calls over 1 y ²⁰ Healthy lifestyle focusing on nutrition and physical activity (intervention was adapted from the “New Life... Choices for Healthy Living With Diabetes” ¹⁹); 5-wk healthy lifestyle intervention included 4 group and 1 individual sessions ²¹ Theory-based (Social Ecological Model), culturally tailored nutrition and physical activity intervention included 8 weekly 2-h sessions with ethnically matched community role models as guest instructors. Intervention also included skills training in a balanced regular exercise regimen, nutrition education focusing on a low-fat, complex carbohydrate-rich diet, social support, and incentives. Participants received a 1-y free gym membership and were able to invite 1 family member or friend to receive a 1-y free membership as well (social support). Incentives included pedometers and exercise bands ²⁴

or older. Both studies reported significant findings including change in steps¹⁶ and changes in muscle-strengthening activity¹⁴ and nonsignificant findings for change in overall PA or total daily energy expenditure, based on objective and self-report data. One study¹⁴ reported a significant difference in muscle-strengthening activity and a nonsignificant difference for moderate PA or total daily expenditure. The other study¹⁶ focused on strategies to increase walking and reported a significant increase in steps, yet nonsignificant for overall PA in hours per week. Increasing both aerobic activity and muscle strengthening is important for older African American women and older adults in general.

The use and benefit of interventions utilizing a theoretical framework are mixed. The review by Banks-

Wallace and Conn¹⁰ revealed an infrequent use of theoretical frameworks, which are essential to intervention studies.⁴⁷ Theoretical frameworks have been emphasized as integral to behavioral and health science research to guide intervention design and evaluation.⁴⁷ This review revealed various theoretical frameworks that were utilized in PA interventions for African American women. In addition to theoretical frameworks, culturally tailored interventions should be considered.¹¹ Interventions that are culturally tailored increase acceptability by participants.¹¹ The majority of culturally tailored interventions reported significant or mixed changes in PA.

This review revealed promising PA intervention strategies for increasing PA in African American women. As with the previous review,¹⁰ intervention components

included problem solving, social support, goal setting, and group exercise. These intervention components have been identified as effective ways to increase PA.^{10,29} Despite faith-based settings being a commonly used site for interventions,¹⁰ few studies in this review were identified as a faith-based setting or faith-based intervention. Notably, mixed results were reported for faith-based interventions and studies held in faith-based settings. Faith communities have the potential to influence the health of African American women,³⁹ particularly for those who consider their faith to be an important part of their life.^{14,16} Future faith-based intervention and faith-based setting studies are warranted. In addition to faith-based intervention studies, group-based and individually tailored interventions were identified. Various barriers to PA for African American women have been reported including costs, child care/caregiving, lack of safe places to exercise, hair maintenance, and lack of time.^{11,42,48} Home-based programs are a promising approach to increase PA while also eliminating several potential PA barriers. Home-based programs included in this review yield mixed results^{18,40,42} and significant changes in PA³³ and PA adherence.²⁹

Physical activity outcomes were most commonly measured by self-report. Moreover, various measurements of PA were included in the review. Physical activity measures included self-report questionnaires and objective measures such as pedometers, accelerometers, 6-minute walk test, and 1 study that utilized SenseWear armbands. Objective measures may decrease the rate of errors, specifically the potential to report inaccurate PA levels with self-report questionnaires. Objective measures may also influence behavior change. For example, research indicates that pedometers help to increase PA.⁴⁹

Participants reported that increasing PA was the most difficult behavior change.¹¹ However, despite difficulty of behavior change, several studies reported high participant satisfaction.^{19,34,35,42} This review identified a diversity of study designs, interventions, and outcomes. Several findings should be cautiously considered because of their lack of a randomized controlled design or a comparison group.^{11,20,27,33–36,38,39,42–44} Several studies utilized a single-arm pre-post design^{29,33,34,37,38,42–44} or quasi-experimental design.^{11,30,40} In addition, several studies included a small sample size.^{14,16,18,22,32–35,38,39,42} Future studies should include a randomized controlled design and objective PA measures. Examining participation rates beyond the study would be an important consideration for future studies. Although several studies report significant results, additional studies focusing on long-term PA maintenance are warranted. Most studies in this review did not include a follow-up period beyond the postintervention measurements. Of the 9 studies that included a follow-up period for measurements, low return for follow-up was identified as a limitation in 2 studies.^{25,26} One study²³ reported significant differences

in vigorous and moderate PA at 6 months for the intervention and control groups; however, at 18 months, PA results were nonsignificant.⁵⁰

Limitations

This review does not include abstracts, dissertations, or studies referenced in other databases. A second limitation is the limited number of studies that focused on older African American women. As with the previous review, small sample size was a common limitation. Additional limitations include the use of self-report measures by most studies and the exclusion of indirect measures of PA including BMI and weight. However, this review focused on direct measures of PA. Indirect measures of PA such as BMI and weight may be influenced by dietary behaviors as well as PA¹⁰; therefore, indirect measures were not a search criterion for this review.

Future Implications/Conclusion

Sixteen of the 32 studies included in this review focused on PA only, whereas the other studies focused on PA and nutrition. Many studies did not include follow-up measures. Future studies that include measures beyond the immediate postintervention measurement are warranted. Many studies included self-report data that may be affected by measurement errors, for example, PA overreporting. Thus, also warranted are future studies using objective measures entirely or studies that combine self-reports with objective measurements. Moreover, future studies including larger sample sizes, randomization, and control groups are needed. Since the Banks and Wallace¹⁰ review, intervention studies promoting PA focusing solely on African American women have increased. This integrative review provides important findings regarding the current state of science for interventions promoting PA within this specific population. Although more PA promotion research is occurring with this population, additional research is warranted. Intervention strategies have the potential to increase PA in African American women and reduce their risk of cardiovascular disease and other chronic health conditions. Nurses, in particular cardiovascular nurses, may use these findings to improve the quality of existing practices and to generate future research. Cardiovascular nurses, as well as other healthcare providers, may use this review to identify intervention strategies that will promote PA in African American women.

Physical inactivity is an important modifiable risk factor for obesity, diabetes, cardiovascular disease, and other chronic health conditions. Intervention strategies that promote PA in African American women are essential to reduce the risk of these preventable health conditions and to reduce health disparities. Many studies in this review revealed promising results. Further studies

What's New and Important

- Physical activity interventions that are theory driven and culturally tailored and include social support have the potential to increase PA in African American women.
- Nurses, including cardiovascular nurses, should be aware of research findings including strengths and limitations. Nurses may utilize findings to design interventions and integrate research into practice.
- Further research promoting PA in older African American women is warranted.

are needed to evaluate long-term outcomes and sustainable methods for PA behavior change.

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Manuscript II

Physical Activity and Cardiometabolic Risk Factors among African American Women Residing
in the Southeastern United States: REACH Risk Factor Survey

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in the Southeastern United States: REACH Risk Factor Survey

Corresponding Author: Felicia Jenkins, MSN, RN^{1, 2}
 Doctoral Student, MUSC
 Mailing Address: University of South Carolina Upstate
 800 University Way
 Spartanburg, SC 29303
fjenkins@uscupstate.edu
 (864) 503-5412

Gayenell S. Magwood, PhD, RN¹

Martina Mueller, PhD, RN¹

Mathew J. Gregoski, PhD, MS¹

Lynette Gibson, PhD, RN²

Carolyn Jenkins, DrPH, MSN, RD, LD, FAAN¹

¹College of Nursing, Medical University of South Carolina

²University of South Carolina Upstate

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Abstract = 249 words – not including headings (max 250);

Text = 2970 words (not including subheadings) (max. 3,000 words; 30 references)

Abstract

Introduction: Physical inactivity and obesity increase cardiometabolic risks including elevations in blood pressure, blood glucose, and cholesterol. African American women have some of the highest rates of cardiometabolic risk factors leading to increasing risks of chronic health conditions. The purpose of this study was to examine the association of physical activity levels and selected cardiometabolic risk factors among African American women.

Method: A secondary data analysis was performed using REACH Risk Factor survey data (2001 - 2012) from African American women living in two coastal counties in the southeastern United States. African American women who reported a response to survey items pertaining to moderate or vigorous-intensity physical activity were included. SPSS Complex samples procedures were used for descriptive statistics, chi-square analysis, and logistic regression.

Results: A total of 4,160 African American women, most being overweight or obese, participated in the survey; of those 73.0% did not meet moderate-intensity physical activity recommendations, and 54.9% did not meet vigorous-intensity physical activity recommendations. Logistic regression models revealed statistically significant associations between diabetes, hyperlipidemia, and physical activity. African American women without a history of diabetes and with a self-reported history of hyperlipidemia were more likely to meet vigorous-intensity PA recommendations than women with a history of diabetes and hyperlipidemia. Further, there was an association between diabetes, hyperlipidemia, and fruit and vegetable consumption.

Conclusion: This group of African American women reported a low rate of meeting recommendations for physical activity and fruit and vegetable consumption. Health-promoting strategies to improve these lifestyle behaviors in African American women are needed.

Key words: African American women, cardiometabolic risk, physical activity, rural, disparities

Introduction

Physical inactivity and sedentary lifestyle are major contributing factors for morbidity and mortality worldwide.¹ Physical inactivity contributes to cardiovascular disease (CVD), type 2 diabetes, hypertension, and other chronic health conditions. Physical inactivity is a public health concern for more than half of all adults,² and African American women (AAW) have a higher prevalence of physical inactivity. In 2014 only 35.5% of AAW met PA guidelines, compared to 47.5% for African American men, 50.9% for Non-Hispanic White women, and 56.4% for Non-Hispanic White men.³ In addition to having higher rates of physical inactivity, AAW have significant disparities for health conditions linked to insufficient PA.

When compared to non-Hispanic White women, AAW have a higher rate of obesity, hypertension, diabetes, and mortality from diabetes and CVD.⁴⁻⁶ Obesity, hypertension, and dyslipidemia are cardiometabolic risk (CMR) factors that increase the likelihood of developing stroke and/or CVD. Notably, AAW have the highest rate for several of these CMR factors that may result from lifestyle choices such as physical inactivity and nutrition behaviors such as not consuming enough fruits and vegetables; yet AAW represent the least studied population in research that examines PA levels and CMR with limited research focusing on PA interventions among AAW.⁷ The purpose of this secondary analysis was to determine the PA levels and the association of PA level and CMR in a sample of AAW in the South Carolina counties of Charleston and Georgetown who participated in the Racial and Ethnic Approaches to Community Health (REACH) Risk Factor Surveys.⁸ We hypothesized that PA level would be associated with prevalence of CMR factors. The secondary analysis study was guided by Pender's Health Promotion Model (HPM) to examine individual characteristics (i.e. personal factors) and health-promoting behaviors such as being physically active, not smoking, and consuming fruits/vegetables (Figure 1).⁹

Methods

The research received exempt status from the Medical University of South Carolina Institutional Review Board and the Centers for Disease Control and Prevention. A secondary data analysis of nine years of REACH 2010 and REACH U.S. Risk factor survey data (2001 – 2012) was conducted for a sample of AAW living in the South Carolina counties of Charleston and Georgetown. AAW who responded to moderate or vigorous intensity PA survey items were included in the study data set. New data sets that adhered to the eligibility criteria were created for each year and then combined into one dataset for analysis. A ‘year’ variable was created within the combined dataset to allow separate data analysis for each year. The study examined PA patterns and whether an association occurred between level of PA and CMR factors, notably, hypertension, hyperlipidemia, obesity, and diabetes. We also examined the association of CMR with lifestyle factors, in particular, smoking and fruit and vegetable consumption.

REACH Methodology: Data Sets

This secondary analysis included REACH Risk Factor survey data from the Charleston and Georgetown Coalition. In 1999, REACH was launched by the Centers for Disease Control and Prevention [CDC] as a response to the U.S. Department of Health and Human Services’ initiative to eliminate racial and ethnic disparities in health status.⁸ In response to the CDC REACH 2010 program, the Charleston and Georgetown Coalition, a diverse community-campus partnership, was established.⁸ REACH communities collaborated with CDC and their contractors to develop the REACH Risk Factor surveys that were administered annually in 21 communities across the United States. The self-report questionnaires included questions regarding health status, health-care access, self-reported height and weight, fruit and vegetable intake, level of PA, cigarette smoking, and awareness of various health issues including diabetes, hypertension, cholesterol, and cardiovascular disease.¹⁰ REACH Risk Factor surveys used

complex sampling designs. The surveys were administered by in-person interviews, questionnaire mailings, and telephone interviews using random digit dialing (RDD) or a combination of RDD and listed telephone numbers.¹¹

Variables

Physical activity refers to energy expenditure from body movements produced by skeletal muscles.¹ This secondary data analysis examined self-reported PA categorized as moderate and vigorous. Moderate-intensity PA refers to activities that cause a small increase in breathing or heart rate (e.g., brisk walking, vacuuming, and gardening); vigorous-intensity PA refers to activities that cause a large increase in breathing or heart rate (e.g., running, aerobics, and heavy yard work). The American Heart Association (AHA) recommends 30 minutes or more of moderate-intensity aerobic activity at least five days per week or 25 minutes or more of vigorous-intensity aerobic activity at least three days per week.¹² Participants self-reported the number of days and the number of minutes per day they participated in both moderate and vigorous PA. For the purposes of the current analysis, AHA recommendations were used as the guideline for meeting PA.¹² Physically active refers to those who are meeting PA guidelines. Participants also self-reported CMR factors including blood glucose, blood pressure, blood lipids (cholesterol), and weight. For the purposes of this study, elevated blood glucose refers to the participant's self-reported history of diabetes. Prediabetes refers to a self-reported history of prediabetes. Hypertension refers to a self-reported history of hypertension. Prehypertension refers to a self-reported history of prehypertension. Hyperlipidemia refers to a self-reported history of high cholesterol. Weight and height were self-reported by participants.

To obtain data regarding obesity, the BMI calculation recommended by the Centers for Disease Control and Prevention¹³ was used: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$. BMI was reported as normal weight, overweight, and obese. Normal weight refers to a BMI between 18.5 to 24.9,

overweight refers to a BMI of 25.0 to 29.9, and obese refers to a BMI equal to or greater than 30.0.^{13,14} Smoking status and consumption of fruits and vegetables were self-reported as well. Smoking status refers to whether participants were current smokers at the time of the study. The AHA recommends eight or more daily servings of fruit and vegetables.¹⁵ The United States Department of Agriculture (USDA) recommends 1.5 to 2 cups of fruit and 2 to 2.5 cups of vegetables per day.¹⁶ For this analysis, daily consumption of fruits and vegetables were reported. Participants consuming at least 5 daily servings were considered to have met fruit and vegetable intake requirements.

Data Analysis

IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp. 2013, Armonk, NY) were used for data analysis. Data were analyzed using SPSS Complex Samples Procedures (CP) that incorporate complex sampling designs, such as the one used for data collection of the REACH Risk Factor survey, to obtain accurate and reliable estimates of statistics and their standard errors of weighted data. Descriptive statistics were calculated to characterize the participant sample. Pearson's chi-square tests were performed to investigate the relationship between PA (moderate-intensity and vigorous-intensity) and each of the CMR factors (BMI, hyperlipidemia, hypertension, and diabetes). Further, Pearson's chi-square tests were performed for additional lifestyle factors (i.e., smoking and consumption of fruit and vegetables) and CMR factors. Binary logistic regression was used to determine if a relationship existed between PA and each CMR variable. Specifically, logistic regression was performed to determine which independent variables were predictors for meeting PA recommendations in this sample of AAW. Logistic regression models included the four potential predictors (independent variables) separately: BMI, hyperlipidemia, hypertension, and diabetes. A small number of smokers were overweight and self-reported a history of prediabetes, which led to invalid models when including both variables;

thus, a binary variable for diabetes was used comparing individuals with a history of prediabetes or diabetes to individuals without prediabetes or diabetes. The analysis controlled for the demographic variables age, education, and income. Additional logistic regressions were performed to examine two-way interactions of predictor variables to investigate potential effect moderation. Significant findings were determined using a significance level of 0.05.

Results

The sample population consisted of 4,160 AAW living in Charleston and Georgetown counties in South Carolina. The mean age of the participants was 45.2 years (Table 1). Almost half of the women (1954 [49.8%]) were employed, and 786 (13.8%) were retired. Fifty-one percent of the women reported an income below \$25,000. Most respondents (3130 [79.4%]) reported not having a history of diabetes, while 17.2% self-reported having diabetes. A self-reported history of hyperlipidemia and hypertension occurred more commonly in this sample, 35.9% and 43.3%, respectively. Most women were either obese (1826 [43.2%]) or overweight (1276 [30.0%]) with a mean BMI of 30 [kg/m²] for the entire sample. The majority of women did not meet moderate-intensity or vigorous-intensity PA recommendations, 73.0% and 54.9%, respectively. Appendix 2 provides percentages for each CMR factor per year (i.e. weight, hypertension, hyperlipidemia, diabetes, and PA). Notably, most women were overweight or obese for each year of the REACH Risk Factor surveys. Furthermore, the percentage of women who reported a history of diabetes increased from year 1 to year 9.

CP Pearson chi-square analyses (table 2) demonstrated a statistically significant association between a self-reported history of hypertension and whether participants met AHA recommendations for moderate-intensity PA ($X^2(1) = 6.3, p = .029$). AAW with a self-reported history of hypertension were more likely to not meet moderate-intensity PA recommendations. AAW without a history of hypertension were more likely to meet PA recommendations when

compared to AAW with a history of hypertension. Similarly, there was a significant association between a self-reported history of hypertension and whether participants met AHA recommendations for vigorous-intensity PA ($X^2(1) = 9.13, p = .007$). AAW without a self-reported history of hypertension were more likely to meet vigorous-intensity PA recommendations. CP logistic regression was performed to examine the relationship of each predictor variable with PA. Furthermore, two-way interactions between predictor variables were examined. Separate logistic regressions were performed for moderate-intensity PA and vigorous-intensity PA as dependent variables. The odds of meeting moderate-intensity PA recommendations were 1.3 times higher in those without a self-reported history of hypertension versus those with a history of hypertension ($p = .016$). The odds of meeting vigorous-intensity PA recommendations were 1.3 times higher in those without a self-reported history of hypertension compared to those with a history of hypertension ($p = .016$). There were no significant associations between PA and diabetes or between PA and cholesterol. Interestingly, there was a statistically significant interaction between diabetes and cholesterol, indicating that the effect of diabetes history on vigorous intensity PA differed depending on coexistence of hyperlipidemia (and vice versa). Women without a history of diabetes or with prediabetes and with a self-reported history of hyperlipidemia were more likely to meet vigorous-intensity PA recommendations versus women with a history of diabetes and hyperlipidemia. Table 3 reports odds ratios and confidence intervals for each CMR factor.

Results from CP Pearson chi-square analysis for lifestyle factors are reported in table 2. CP Pearson chi-square demonstrated a statistically significant association between weight and smoking status ($X^2(1) = 8.12, p = .013$). Obese AAW were more likely to not smoke than AAW who were not obese. There was a significant association between self-reported history of prehypertension and whether participants smoked ($X^2(1) = 15.56, p = .000$). CP logistic

regression was performed controlling for age, education, and income; the results supported the chi-square analysis. For women with a history of prehypertension, the odds of smoking were 3.1 times higher than for women without a history of prehypertension ($p = .001$).

There was a statistically significant association between weight and whether participants met fruit/vegetable recommendations ($X^2(1) = 5.92, p = .034$). The odds of not meeting fruit and vegetable recommendations were 1.2 times higher in those who were obese compared to those who were not obese ($p = .034$). There was no significant association for diabetes. However, there was a significant association for hyperlipidemia and between the interaction of diabetes and hyperlipidemia for fruit and vegetable consumption. Women with a history of prediabetes and no hyperlipidemia were more likely to meet fruit and vegetable intake recommendations compared to women with prediabetes with hyperlipidemia and compared to women with or without a history of diabetes (Figure 2). Those with a history of diabetes and hyperlipidemia were less likely to meet fruit and vegetable recommendations compared to those with a history of prediabetes and hyperlipidemia. Results from complex samples logistic regression models are reported in Table 3.

Discussion

Previous research indicated that AAW have a low rate of meeting PA recommendations.¹⁷ The findings in this secondary analysis are consistent with previous research, with AAW in the sample having a low percentage of meeting PA recommendations. Interestingly, more AAW in this sample met recommendations for vigorous-intensity PA than moderate-intensity PA. Findings indicate that 73.0% of participants did not meet moderate-intensity, and 54.9% did not meet vigorous-intensity PA recommendations. This finding may be related to the recommended number of minutes and days per week. Guidelines advise 25 minutes of vigorous-intensity PA on at least 3 days and 30 minutes of moderate-intensity PA on

at least 5 days. It is important to note that participants responded to moderate-intensity and vigorous-intensity PA survey items based on their fitness level. It is possible that participants may be deconditioned; thus, any participation in PA might have been considered vigorous-intensity.

Research indicates that PA is a protective factor, and individuals meeting PA recommendations may have a lower mortality risk compared to those not meeting PA recommendations.¹⁸ In our study, AAW without a history of hypertension were more likely to meet moderate-intensity PA and vigorous-intensity PA recommendations. The findings indicate that 25% of AAW with hypertension and 28.4% of AAW without hypertension met moderate-intensity PA recommendations. These findings are similar for vigorous-intensity for those with hypertension (40.4%) and those without hypertension (47.7%). Hypertension was one of the most common self-reported health conditions in this study (43.3%), a similar finding in previous research.¹⁷ Although there was a statistically significant association between hypertension and PA, it is important to note that AAW self-reported PA and history of hypertension. It is possible that AAW participating in this study over reported or under reported PA behaviors. From a public health standpoint, increasing PA would benefit both women without hypertension and women with a history of hypertension or prehypertension.

In addition to PA, lifestyle behaviors include smoking status and the consumption of fruits and vegetables. Most women in this study had never smoked (71.2%), a health promoting behavior that is similar to previous research.¹⁹ Women in this study without a history of prehypertension were less likely to smoke compared to women with a history of prehypertension. The current study revealed that most participants did not consume enough fruits and vegetables, a finding similar to previous studies.²⁰ Increasing fruit and vegetable consumption would be important to help decrease obesity, hyperlipidemia, and other health conditions. Previous

research indicates that a high intake of fruit and vegetable consumption corresponds with a lower LDL level.²¹ In the current study, women with prediabetes and no history of hyperlipidemia were more likely to meet fruit and vegetable recommendations when compared to women with prediabetes and a history of hyperlipidemia. Further, obese women were less likely to meet fruit and vegetable recommendations. Promoting healthy food choices is important from a public health standpoint. Promoting healthy lifestyle behaviors, such as fruit and vegetable consumption, also requires consideration of contributing factors. Factors associated with fruit and vegetable consumption may include a need for nutrition education or greater awareness, cost, and access to healthy food choices.²²

A limitation of the current study is the use of self-reported data, due to the potential for providing socially acceptable responses or inaccurately reporting data. Further, self-reported data did not include information regarding whether participants with hypertension, diabetes, or hyperlipidemia were controlled. Future studies should include questions regarding whether the participant's self-reported health condition is under control. Also, future studies should obtain data regarding when participants started participating in PA. It is possible that AAW in this sample had recently started participating in PA, which may not reflect their prior pattern of PA. A second limitation is that results may not be generalized to other geographic locations as well as to recruited individuals who did not participate in REACH Risk factor survey administration. It is possible that AAW participating in the surveys do not represent women who declined to participate. A third limitation is that it is possible that AAW in this sample participated more than once, since the REACH Risk Factor survey was administered annually.

Despite these limitations, this secondary analysis provides essential information regarding PA levels and the association of PA and CMR factors among a large sample of AAW in two coastal communities in the Southeastern United States. The findings from this secondary

analysis have public health implications because they provide data regarding health promoting behaviors and self-reported history of chronic health conditions over a nine year period.

Previous research indicates that AAW with a high rate of physical inactivity and chronic health conditions are an understudied population in research promoting PA.⁷ Further studies examining PA and CMR factors and PA promotion strategies among AAW are warranted. Research studies examining strategies to promote PA should examine the influence of PA on CMR as well.

Lifestyle behaviors such as physical inactivity and low fruit and vegetable consumption are risk factors for various chronic health conditions. These lifestyle behaviors coupled with CMR risk factors, such as diabetes, obesity, hyperlipidemia, and hypertension, further increase an individual's likelihood of developing stroke or CVD. AAW typically do not consume enough fruits and vegetables and have a high rate of physical inactivity and overweight/obesity. Therefore, health care providers are advised to assess CMR, PA status, smoking status, and daily consumption of fruits and vegetables routinely. Health care providers also should identify barriers and facilitators for participating in health-promoting behaviors. Promoting healthy behaviors is essential, e.g., in particular consuming the daily recommended amounts of fruits and vegetables and participating in PA. Providers also are encouraged to promote awareness among AAW regarding recommended guidelines as well as health implications that may result from not engaging in health-promoting behaviors. Further research that focuses on increasing health promoting behaviors among AAW and examines the association of these behaviors on CMR factors is needed.

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Table 1. Demographic and survey data for participants (all years combined)

Characteristic	N (%)
Age (mean [SEM])	45.2 (1.0)
Education	
<i>Kindergarten or less</i>	4 (0.1%)
<i>Elementary</i>	137 (2.8%)
<i>Some high school</i>	443 (11.1%)
<i>High school graduate</i>	1401 (34.2%)
<i>Some college</i>	1231 (30.6%)
<i>College graduate</i>	933 (21.2%)
Income	
< \$25,000	2054 (51%)
\$25,000 to < \$50,000	1169 (28.9%)
> \$50,000	654 (14.5%)
Employment	
<i>Employed for wages</i>	1954 (49.8%)
<i>Self-employed</i>	165 (4.5%)
<i>Out of work (> 1year)</i>	194 (5.3%)
<i>Out of work (< 1year)</i>	184 (5.4%)
<i>Homemaker</i>	197 (4.5%)
<i>Student</i>	162 (5.7%)
<i>Retired</i>	786 (13.8%)
<i>Unable to work</i>	474 (10.5%)
Self-reported:	
Diabetes	864 (17.2%)
Prediabetes	88 (1.9%)

Hypertension	2079 (43.3%)
Hyperlipidemia	1413 (35.9%)
Fruit & vegetable	
<i>Less than 1 per day or never</i>	191 (5.2%)
<i>1 to less than 3 times per day</i>	1377 (34.3%)
<i>3 to less than 5 times per day</i>	1325 (30.8%)
<i>5 or more times per day</i>	1228 (29.1%)
Physical activity recommendations	
<i>Moderate-intensity</i>	
<i>Met</i>	1050 (27.0%)
<i>Not met</i>	2953 (73.0%)
<i>Vigorous-intensity</i>	
<i>Met</i>	735 (45.1%)
<i>Not met</i>	942 (54.9%)
Body Mass Index (BMI)	
<i>Normal</i>	904 (23.2%)
<i>Overweight</i>	1276 (30.0%)
<i>Obese</i>	1826 (43.2%)
Smoking status	
<i>Current smoker</i>	
<i>Smokes everyday</i>	378 (9.3%)
<i>Smokes some days</i>	212 (5.0%)
<i>Former smoker</i>	671 (13.8%)
<i>Never smoked</i>	2862 (71.2%)

Table 2. Associations between lifestyle factors and self-reported cardiometabolic risk factors

	Current Smoker N (%)	Not a Smoker N (%)	X ²	p-value
Weight (BMI)				
Normal (reference category)	171 (17.5%)	727 (82.5%)		
Overweight	188 (15.2%)	1078 (84.8%)	.60	.503
Obese	219 (12.6%)	1586 (87.4)	8.12	.013
Diabetes				
<i>No diabetes</i> (reference category)	469 (14.7%)	2642 (85.3%)		
<i>Prediabetes</i>	5 (7.9%)	81 (92.1%)	2.65	.166
<i>History of diabetes</i>	103 (12.7%)	752 (87.3%)	1.20	.183
<i>Gestational diabetes</i>	5 (13.7%)	43 (86.3%)	.02	.917
Hyperlipidemia	176 (13.4%)	1222 (86.6%)	.02	.905
Hypertension				
<i>No hypertension</i> (reference category)	286 (13.7%)	1713 (86.3%)		
<i>Prehypertension</i>	16 (33.7%)	37 (66.3%)	15.56	.000
<i>Hypertension</i>	284 (14.5%)	1769 (85.5%)	.04	.858
Moderate Physical Activity				
	Recommendations Not Met N (%)	Recommendations Met N (%)	X ²	p-value
Weight (BMI)				
Normal (reference category)	635 (72.9%)	235 (27.1%)		
Overweight	899 (73.2%)	330 (26.8%)	.00	.998
Obese	1325 (73.4%)	437 (26.6%)	.25	.673
Diabetes				
<i>No diabetes</i> (reference category)	2189 (72.4%)	816 (27.6%)		
<i>Prediabetes</i>	64 (77.5%)	21 (22.5%)	.80	.388
<i>History of diabetes</i>	645 (75.7%)	192 (24.3%)	3.61	.108
<i>Gestational diabetes</i>	33 (67.0%)	16 (33.0%)	1.13	.391
Hyperlipidemia	1010 (74.2%)	343 (25.8%)	.64	.481
Hypertension				
<i>No hypertension</i> (reference category)	1390 (71.6%)	539 (28.4%)		
<i>Prehypertension</i>	33 (63.3%)	17 (36.7%)	2.31	.169
<i>Hypertension</i>	1516 (75.0%)	490 (25.0%)	6.27	.029
Vigorous Physical Activity				
	Recommendations Not Met N (%)	Recommendations Met N (%)	X ²	p-value
Weight (BMI)				
Normal (reference category)	226 (52.9%)	201 (47.1%)		
Overweight	300 (54.9%)	231 (45.1%)	.01	.949
Obese	382 (56.1%)	278 (43.9%)	.55	.523
Diabetes				
<i>No diabetes</i> (reference category)	735 (54.7%)	581 (45.3%)		
<i>Prediabetes</i>	17 (42.6%)	24 (57.4%)	2.31	.158
<i>History of diabetes</i>	168 (58.0%)	115 (42.0%)	1.05	.342
<i>Gestational diabetes</i>	12 (52.2%)	11 (47.8%)	.08	.807
Hyperlipidemia	297 (54.8%)	236 (45.2%)	.01	.936

Hypertension <i>No hypertension</i> (reference category) <i>Prehypertension</i> <i>Hypertension</i>	477 (52.3%) 14 (45.5%) 448 (59.6%)	432 (47.7%) 11 (54.5%) 288 (40.4%)	.87 9.13	.387 .007
Fruit/Vegetable Intake				
	Recommendations Not Met N (%)	Recommendations Met N (%)	X ²	p-value
Weight (BMI) Normal (reference category) Overweight Obese	608 (68.9%) 863 (68.8%) 1309 (72.7%)	286 (31.3%) 405 (31.2%) 498 (27.3%)	2.65 5.919	.156 .034
Diabetes <i>No diabetes</i> (reference category) <i>Prediabetes</i> <i>History of diabetes</i> <i>Gestational diabetes</i>	2219 (71.5%) 50 (61.1%) 569 (68.2%) 35 (72.1%)	891 (28.5%) 36 (38.9%) 282 (31.8%) 14 (27.9%)	3.598 2.608 .057	.072 .122 .842
Hyperlipidemia	969 (70.3%)	423 (29.7%)	.091	.786
Hypertension <i>No hypertension</i> (reference category) <i>Prehypertension</i> <i>Hypertension</i>	1423 (71.8%) 33 (64.8%) 1425 (69.5%)	573 (28.2%) 19 (35.2%) 631 (30.5%)	.853 2.240	.393 .187

Table 3. Logistic regression predicting lifestyle behaviors from self-reported cardiometabolic risk factors.
Results for main factors were determined from bivariate models; modeling of interaction terms included the main factors

	B (SE)	Wald X ²	p-value	Odds Ratio	95% CI (lower, upper)
Smoking status					
Obese	-.25 (.33)	3.25	.197	.78	.41, 1.51
Diabetes	.42 (.16)	2.54	.281	.66	.48, .91
Hyperlipidemia	.21 (.18)	.03	.855	1.24	.87, 1.76
Hypertension	-.39 (.27)	12.57	.002	.67	.39, 1.15
Hyperlipidemia*Diabetes	.30 (.28)	1.11	.574	1.35	.77, 2.35
Hyperlipidemia*Hypertension	-.09 (.26)	1.25	.536	.91	.55, 1.51
Hyperlipidemia*Obese	.00 (.30)	5.14	.077	1.00	.55, 1.82
Diabetes*Hypertension	.62 (.30)	7.95	.093	1.85	1.03, 3.33
Diabetes*Obese	-.14 (.36)	2.77	.250	.87	.43, 1.75
Hypertension*Obese	-.19 (.26)	4.87	.301	.83	.49, 1.38
Fruit & Vegetable Consumption					
Obese	-.05 (.16)	.69	.709	.95	.69, 1.31
Diabetes	.23 (.14)	5.63	.060	1.26	.96, 1.66
Hyperlipidemia	.06 (.18)	5.97	.015	1.06	.75, 1.49
Hypertension	.33 (.13)	1.60	.449	1.39	1.08, 1.78
Hyperlipidemia*Diabetes	-.13 (.21)	6.57	.037	.87	.58, 1.30
Hyperlipidemia*Hypertension	-.08 (.19)	.22	.898	.92	.63, 1.34
Hyperlipidemia*Obese	-.34 (.24)	2.29	.318	.72	.45, 1.15
Diabetes*Hypertension	-.64 (.23)	8.06	.089	.53	.34, .83
Diabetes*Obese	-.04 (.29)	1.10	.894	.96	.55, 1.70
Hypertension*Obese	-.32 (.22)	5.72	.221	.73	.47, 1.11
Moderate-intensity PA					
Obese	.43 (.29)	.23	.893	1.53	.87, 2.70
Diabetes	.26 (.15)	2.33	.312	1.30	.97, 1.75
Hyperlipidemia	-.03 (.12)	.11	.739	.98	.77, 1.24
Hypertension	.27 (.16)	8.30	.016	1.3	.95, 1.79
Hyperlipidemia*Diabetes	.23 (.23)	1.04	.594	1.26	.80, 1.98
Hyperlipidemia*Hypertension	-.01 (.20)	.21	.901	.99	.67, 1.47
Hyperlipidemia*Obese	-.17 (.26)	3.27	.195	.85	.51, 1.40
Diabetes*Hypertension	-.24 (.25)	7.08	.132	.79	.48, 1.29
Diabetes*Obese	-.520 (.313)	3.60	.463	.59	.32, 1.10
Hypertension*Obese	.08 (.23)	1.87	.759	1.09	.69, 1.71
Vigorous-intensity PA					
Obese	.06 (.42)	2.88	.237	1.06	.47, 2.42
Diabetes	-.03 (.22)	6.08	.048	.97	.63, 1.49
Hyperlipidemia	.26 (.18)	.13	.717	1.29	.91, 1.84
Hypertension	-.25 (.22)	8.24	.016	.78	.51, 1.19
Hyperlipidemia*Diabetes	-.85 (.34)	6.18	.045	.43	.22, .84
Hyperlipidemia*Hypertension	-.27 (.28)	1.37	.505	.77	.45, 1.32
Hyperlipidemia*Obese	-.23 (.35)	1.99	.369	.80	.40, 1.60
Diabetes*Hypertension	.34 (.37)	3.38	.496	1.40	.68, 2.89
Diabetes*Obese	-.19 (.45)	5.07	.280	.83	.34, 2.01
Hypertension*Obese	.15 (.31)	2.60	.626	1.16	.63, 1.12

Appendix

Cardiometabolic risk factors (by year)									
	REACH 2010 Year 1	REACH 2010 Year 2	REACH 2010 Year 3	REACH 2010 Year 4	REACH 2010 Year 5	REACH U.S. Year 1	REACH U.S. Year 2	REACH U.S. Year 3	REACH U.S. Year 4
BMI (%)									
<i>Normal</i>	24.4%	28.3%	23.0%	26.3%	23.4%	19.5%	21.8%	22.4%	19.1%
<i>Overweight</i>	35.4%	29.4%	30.2%	31.4%	29.5%	29.9%	26.1%	28.9%	30.8%
<i>Obese</i>	36.9%	37.6%	42.9%	40.4%	41.9%	49.1%	49.3%	44.6%	45.4%
Self-reported:									
Hyperlipidemia (%)	27.9%	26.2%	34.7%	38.7%	39.3%	34.7%	42.5%	42.2%	35.6%
Diabetes (%)	13.8%	13.2%	12.7%	17.6%	18.1%	19.0%	19.8%	19.5%	21.0%
Hypertension (%)	37.5%	37.4%	38.0%	43.5%	48.2%	45.0%	47.5%	47.7%	43.5%
Physical Activity (%)									
<i>Moderate-intensity</i>									
<i>Met</i>	28.7%	21.1%	28.3%	26.4%	34.0%	24.0%	26.2%	25.7%	27.9%
<i>Not met</i>	71.3%	78.9%	71.7%	73.6%	66.0%	76.0%	73.8%	74.3%	72.1%
<i>Vigorous intensity</i>									
<i>Met</i>	36.5%	35.2%	41.7%	42.3%	44.0%	51.6%	48.5%	50.9%	52.5%
<i>Not met</i>	63.5%	64.8%	58.3%	57.7%	56.0%	48.4%	51.5%	49.1%	47.5%

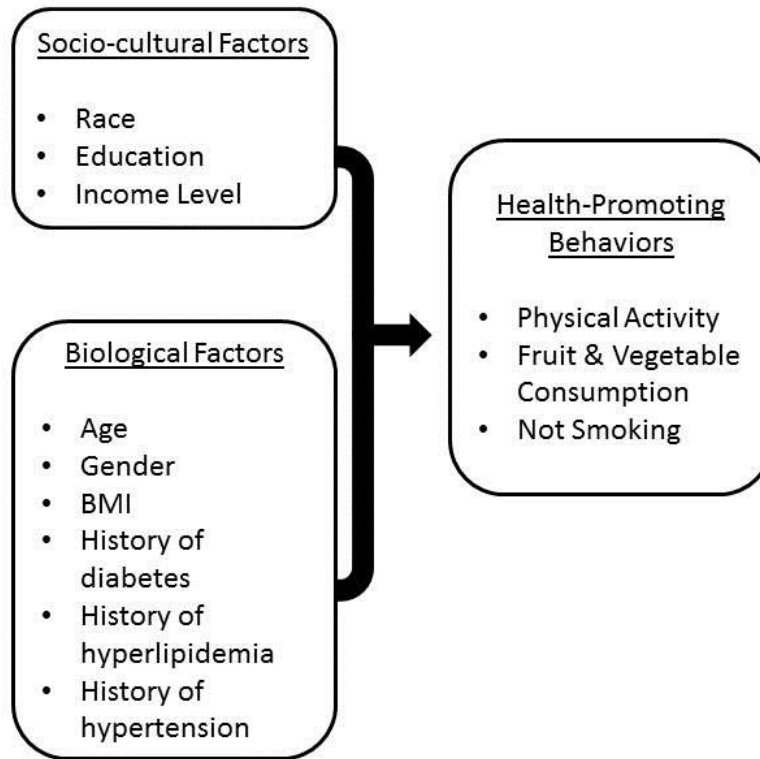


Figure 1. Selected Health Promotion Model concepts - Modified HPM (Sakraida, 2014)

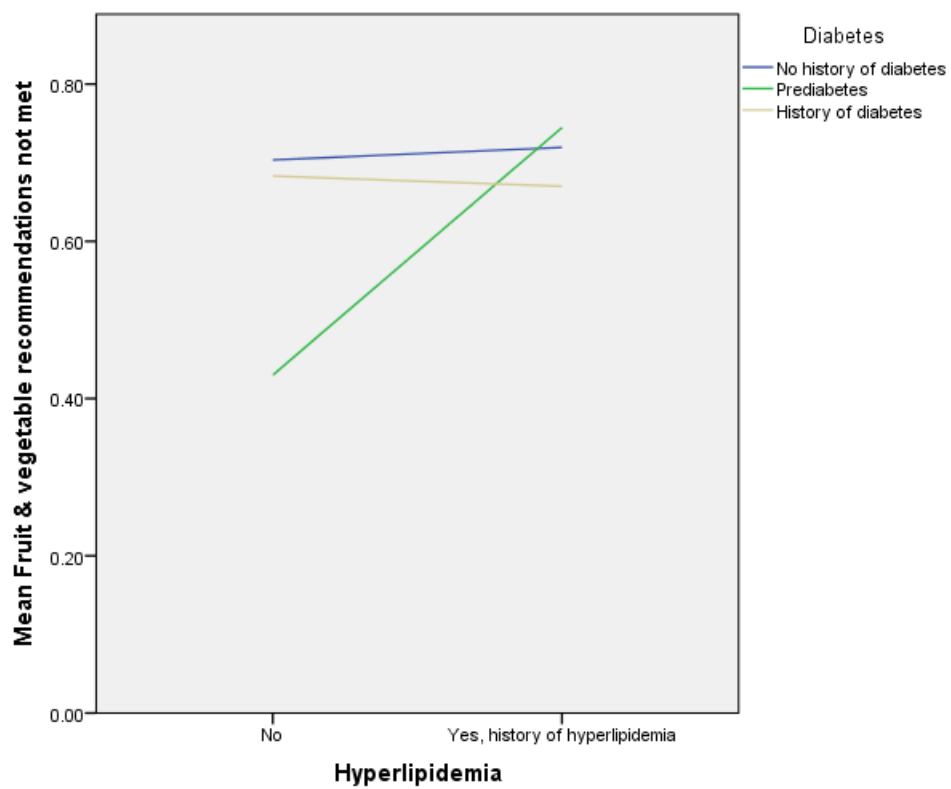


Figure 2. Interaction of hyperlipidemia and diabetes for fruit/vegetable consumption

Manuscript III

Screening for Physical Activity and Cardiometabolic Risk Factors among Rural African
American Women

Screening for Physical Activity and Cardiometabolic Risk Factors among Rural African American Women

Corresponding Author: Felicia Jenkins, MSN, RN^{1, 2}
Mailing Address: University of South Carolina Upstate
800 University Way
Spartanburg, SC 29303
fjenkins@uscupstate.edu
(864) 503-5412

Gayenell S. Magwood, PhD, RN¹

Martina Mueller, PhD, RN¹

Lynette Gibson, PhD, RN²

Mathew J. Gregoski, PhD, MS¹

Carolyn Jenkins, DrPH, MSN, RD, LD, FAAN¹

¹College of Nursing, Medical University of South Carolina

²University of South Carolina Upstate

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Conflict of Interest

The authors have no conflicts of interest to disclose.

Abstract

Physical inactivity can have major implications for cardiovascular disease and diabetes, which are leading causes of morbidity among African American women. African American women have the highest rate of physical inactivity and obesity when compared to other gender/ethnic groups. This feasibility study examined physical activity (PA) levels and cardiometabolic risk (CMR) factors in African American women as well as acceptability and implementation of community-based screening using a modified Racial and Ethnic Approaches to Community Health (REACH) Risk Factor self-report survey. Participants (n = 32) included African American/Black women, 21 years of age or older, who attended health screening events in rural upstate counties of South Carolina. Women who consented to participate in the study agreed to allow their health screening results, survey responses, and evaluation survey responses to be used for research purposes. Hypertension and hyperlipidemia were the most commonly self-reported health conditions. Most participants reported their physical activity level as not meeting the American Heart Association's moderate-intensity or vigorous-intensity PA recommendations. Overall, participants were satisfied with their health screening experience and indicated that they would participate in future screenings. Findings from this study demonstrated the feasibility of community-based CMR screenings using a modified REACH Risk factor survey and linking participants to follow-up primary care.

Key Words: African American, women, physical activity, cardiometabolic risk factors, rural

Introduction

Cardiovascular disease (CVD) is one of the leading causes of death for men and women, with one in four deaths attributed to CVD (Centers for Disease Control and Prevention [CDC], 2015a, 2015b). Death from cardiovascular disease and stroke accounts for one out of every three deaths in women (American Heart Association [AHA], 2016). When compared to non-Hispanic White women, African American women (AAW) have a higher prevalence of heart disease. In 2013, death rates from cardiovascular disease were 176.4 and 134.6 per 100,000 for AAW and Non-Hispanic White women, respectively (Office of Minority Health [OMH], 2016). Further, AAW have a higher prevalence of cardiometabolic risks (CMR) associated with cardiovascular disease. Cardiometabolic risk includes factors such as hypertension, dyslipidemia, and obesity, which increase an individual's overall risk for developing diabetes, stroke, and/or CVD (Ruilope, Sierra, Segura, & Garcia-Donaire, 2007). Dyslipidemia refers to elevated low-density lipoproteins (LDL), elevated triglycerides, and/or a decreased level of high-density lipoprotein (HDL). Cardiometabolic risk increases when individuals have more than one risk factor. Microalbuminuria has gained attention as a marker for CVD (Currie & Delles, 2013; Jarraya et al., 2013; Weir, 2007) and it is an early indicator of chronic kidney disease (CKD) (Jarraya et al., 2013). Further, lifestyle choices such as poor diet, physical inactivity, and smoking are contributing factors to CMR. Unhealthy eating habits, such as a diet that is not rich in fruits and vegetables, contribute to chronic health conditions. Currently, 76% and 87% of US adults do not meet the recommendations for fruit and vegetable intake, respectively (Moore & Thompson, 2015). The daily recommendations are 2 to 2.5 cups of vegetables and 1.5 to 2 cups of fruit for women depending on their age (United States Department of Agriculture [USDA], n.d.).

Physical activity (PA), a health-promoting behavior, refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2014). Current PA guidelines recommend at least 30 minutes of moderate-intensity aerobic activity on at least five days per week or at least 25 minutes of vigorous-intensity aerobic activity on at least three days per week and at least two days per week of muscle-strengthening activity (AHA, 2015a). More than 80% of U.S. adults do not meet PA guidelines (U.S. Department of Health and Human Services, 2016) and AAW have the highest rate of physical inactivity (Go, 2014; Lee, 2010). This feasibility study examined 1) the feasibility, acceptability, and implementation of community-based screening using a modified REACH Risk Factor self-report survey; and 2) PA levels and cardiometabolic risk factors among AAW in a rural region of South Carolina that lacked PA and CMR data.

Theoretical Framework

This research used Pender’s Health Promotion Model (HPM), which examines health-promoting behavior (Sakraida, 2014). PA as a health-promoting behavior refers to action outcomes that focus on positive health outcomes (Sakraida, 2014). Several studies have used the HPM as a framework for promoting health or examining health-promoting behaviors of African Americans (Edmonds, 2010; R. L. Johnson, 2005; Newell-Withrow, 2000) and for promoting PA among AAW (Anderson & Pullen, 2013). In the HPM, personal factors are categorized as biological, psychological, and sociocultural. The following concepts from the HPM were used for this study: personal factors (socio-cultural and biological) and health-promoting behaviors. Personal socio-cultural factors included race, education, and income level. Personal biological factors included age, body mass index (BMI), lipids, glucose/A1C, blood pressure, waist

circumference, and microalbumin. Health promoting lifestyle behaviors included PA, consumption of fruits and vegetables, and not smoking (Figure 1).

This feasibility study examined feasibility, acceptability, and implementation of community-based screening using a modified REACH Risk Factor Survey, as well as subsequent linkage to primary care for those who did not have a primary care provider. Also examined were reported PA levels and factors that contribute to CMR, specifically, 1) capillary glucose, 2) BMI, 3) blood pressure (BP), 4) lipids, 5) smoking, and 6) fruit and vegetable consumption among AAW living in rural upstate South Carolina. In addition, urine microalbumin levels were examined for women with risk factors including self-reported history of hypertension or diabetes (U.S. Preventive Services Task Force, 2014).

Methods

Following Institutional Review Board approval of this feasibility study by the Medical University of South Carolina (MUSC), a convenience sample of AAW attending community health screenings was recruited, and women agreeing to participate completed the informed consent process. Participants consented to the use of their health screening results and survey results for research purposes. Health screening results were obtained for capillary glucose, A1C, blood pressure, BMI, waist circumference, lipids, and urine microalbumin. Exclusion criteria for urine microalbumin testing included women with a history of kidney disease or kidney failure or currently experiencing urinary tract infection, hematuria, or menstruation.

Setting/Participant Recruitment

Health screening events occurred at two local African American churches and one senior center in rural upstate South Carolina. The health screening events were advertised through word

of mouth, flyers, church bulletins, a local newspaper, a local community events calendar, and a local radio station. Flyers were e-mailed or printed for dissemination throughout the community including other churches, a community health clinic, and two health department locations. The events were open to church members and members of the senior center, as well as other individuals from the community. The following inclusion criteria guided participant selection: African American/Black women, 21 years of age or older, and resident of the specified county. Health screening participants who met those eligibility criteria and consented to participate were enrolled in the study. Participants consented to the anonymous use of their modified REACH Risk Factor survey responses, health screening evaluation survey responses, and results of their health screenings for research purposes. Health screenings included data on blood pressure, fasting or random blood glucose, A1C, BMI, waist circumference, blood lipids, and urine microalbumin.

Measures

Feasibility, Acceptability, and Implementation Measures

Feasibility was assessed using the organizing framework presented by Tickle-Degnen (2013); the following questions were addressed. Did the number of recruited participants meet expectations? Were eligibility criteria clear and sufficient? Field notes were maintained to evaluate participant recruitment and eligibility criteria. Also, acceptability and implementation of the health screening events were examined. Survey responses were used to assess acceptability, implementation of community-based screening, and the use of the modified REACH Risk Factor survey. Health screening participants completed an 8 – item Likert scale participant survey to rate satisfaction and acceptability. Satisfaction is an outcome interest of

acceptability (Bowen et al., 2009). Survey items included the participants' rating of their satisfaction with health screening. Acceptability of health screening refers to how individuals reacted to or felt about the screening. Field notes summarized implementation of the health screening to assess resources. The following questions related to resource assessment: Did the facility have the physical capacity to handle the number of health screening participants? Did the health screening events have adequate personnel to handle the number of health screening participants? Were referrals made for all participants who needed a primary care provider?

Modified REACH Risk Factor Survey

This feasibility study included the use of Racial and Ethnic Approaches to Community Health (REACH) Risk Factor self-report survey items that examine health-promoting behaviors such as PA, smoking history, and fruit and vegetable consumption. REACH was launched by the CDC to focus on eliminating health disparities issues among ethnic minority populations (source deleted for blinded review; Liao et al., 2004). REACH Risk Factor surveys are the largest community-based surveys that focus on ethnic minority populations and have been administered by in-person interviews, questionnaire mailings, and telephone interviews (Liao et al., 2011). REACH Risk factor survey items are similar to those in the Healthy Lifestyles Profile II, a commonly used scale for examining health-promoting behaviors found in Pender's Health Promotion Model (Sakraida, 2014). All participants completed a modified version of the REACH Risk Factor Survey, consisting of 56 of the original 95 items. Questions included self-reported PA, fruit and vegetable consumption, smoking status, history of hypertension, history of diabetes, and history of hyperlipidemia. PA was reported as moderate-intensity and vigorous-intensity. Moderate-intensity PA refers to activities that cause a small increase in breathing or

heart rate (e.g., brisk walking, vacuuming, and gardening). Vigorous-intensity PA refers to activities that cause a large increase in breathing or heart rate (e.g., running, aerobics, and heavy yard work). Participants self-reported the number of days and the number of minutes per day they engaged in either moderate and/or vigorous PA. For the purposes of this study, 30 minutes of moderate-intensity PA on at least 5 days or 25 minutes of vigorous-intensity PA for at least 3 days (AHA, 2015a) were used as the guideline for meeting PA requirements and for categorizing participants as physically active/inactive. Physically inactive individuals refer to those who are not meeting PA recommendations (New York State Department of Health, 1999; WHO, 2016). Participants also self-reported a history of CMR factors including blood glucose, blood pressure, and blood lipids (cholesterol). Diabetes refers to the patient self-reporting a history of diabetes. Hypertension refers to a self-reported history of high blood pressure. Hyperlipidemia refers to a self-reported history of high cholesterol. Smoking status and consumption of fruits and vegetables were self-reported as well. Smoking status refers to whether participants are current smokers. USDA (n.d.) guidelines were used to determine whether participants met recommendations for fruit and vegetable consumption.

Objective Measures

Objective measures obtained from health screening records included blood pressure, fasting blood glucose or random blood glucose, A1C, waist circumference, BMI, blood lipids, and urine microalbumin. Omron BP791IT monitors were used to measure blood pressure. Random urine samples for microalbumin were measured using microalbumin test strips. Alere Cholestech (Alere Cholestech LDX® System) was used for lipid and glucose measures and DCA Vantage Analyzer (DCA Vantage Analyzer; Siemens Medical Solutions; Malvern, PA) were

used for A1C measures. Additional equipment included digital scales for weight measurements, stadiometer for height, and waist circumference was measured at the umbilicus to the nearest half inch using a tape measure. The specific CMR factors or variables included hypertension, obesity, increased glucose, and hyperlipidemia. Hypertension, or elevated blood pressure, refers to a systolic blood pressure of 140 mm/Hg or higher or a diastolic blood pressure of 90 mm/Hg or higher (AHA, 2015b). The CDC guidelines for overweight and obesity were used. Overweight refers to a BMI of 25.0 to 29.9 kg/m², and obesity refers to a BMI of 30 kg/m² or higher (CDC, 2012). Increased waist circumference refers to measures greater than 35 cm (measured at the umbilicus) for women. Elevated blood glucose refers to a fasting blood glucose ≥ 100 mg/dl, a random blood glucose ≥ 140 mg/dl, or an A1C $> 5.7\%$ (American Diabetes Association [ADA], 2015). An A1C $> 7\%$ is considered elevated for persons with diabetes. Blood lipids (cholesterol) included total cholesterol, low-density lipoproteins (LDL), high-density lipoproteins (HDL), and triglycerides. Hyperlipidemia refers to elevated lipids (LDL and triglyceride levels). Elevated LDL refers to levels ≥ 190 mg/dl (≥ 70 mg/dl for persons with a history of heart disease) and elevated triglycerides refer to levels ≥ 150 mg/dl (Stone et al., 2013; AHA, 2015c). AAW with a history of hypertension or diabetes were screened for microalbuminuria (U.S. Preventive Services Task Force, 2014). Including the feasibility of screening for microalbuminuria was essential given the increased risk of CVD for AAW with CMR factors. Microalbuminuria refers to an elevated microalbumin level in urine. Urine microalbumin levels ≥ 30 mg/L are considered elevated.

Data Analysis

Data collected through field notes were maintained by the primary researcher and analyzed to evaluate feasibility outcomes. Health screening and survey data were entered into REDCap by the primary investigator. Data were reviewed to ensure accuracy with data entry and then downloaded into SPSS version 22.0 (IBM Corp. 2013, Armonk, NY) for data analysis. Data were reviewed to identify missing data. Further, documents for health screening results and survey responses were reviewed for missing results/responses. Upon reviewing the participants' documents, absent data were identified as missing completely at random due to no pattern for missing data and some data missing due to skip patterns in the survey. Cases were omitted from the analysis on a variable-by-variable basis. Descriptive statistics were performed for demographic variables and CMR variables (i.e. smoking, fruit and vegetable consumption, PA, self-report of diabetes, hypertension, and hyperlipidemia). The feasibility study also assessed the following objective clinical variables: urine microalbumin, glucose, A1C, lipids, systolic and diastolic blood pressure, waist circumference, and BMI. Mann-Whitney tests were performed to determine whether significant differences in objective CMR factors existed for participants meeting AHA recommendations versus those not meeting AHA recommendations.

Results

Descriptive Statistics (Sample Demographics)

The sample consisted of 32 AAW with a mean age of 57.2 years. Most of the participants were retired or were employed for wages, 50% (n = 16) and 28.1% (n = 9), respectively. Almost a third of participants had completed high school or earned their GED (n = 10; 31.3%) while 25% (n = 8) were college graduates. Twenty-four participants reported their

income level. Of those, seven participants (29.2%) earned less than \$10,000 per year.

Demographic information is provided in Table 1.

Feasibility outcomes

Recruitment expectations were not met. The recruitment goal was 60 AAW participating in health screening events. Out of 35 approached, a total of 32 AAW (91%) agreed to participate in the feasibility study. During the first health screening, 15 AAW were recruited with 14 consenting to participate. Ten AAW were recruited from the second health screening event with 8 consenting to participate. During the third health event, 10 AAW were recruited and agreed to participate in the study. Eligibility criteria were clear and sufficient for participants as well as health screening personnel. Each health screening site was examined to determine if the physical capacity could handle the number of health screening participants. All three sites had the physical capacity to accommodate the number of health screening participants. Adequate health screening personnel were available to handle the number of health screening participants. In addition to health screening personnel, a representative from a local primary health care office was present. Health screening participants in need of a medical home were referred to this representative to discuss services provided and to start the process for scheduling an appointment. Three participants from the health screening events who wanted to be linked to primary care received follow-up appointments after the health screening event. Follow-up phone calls were provided to women who had elevated health screening results (blood pressure, glucose/A1C, and/or cholesterol). Phone calls included a brief discussion of the participant's elevated health screening result(s) and understanding of education provided during the health

screening event. Discussion also included the participant's plan for following up with their primary care provider.

Overall, participants were satisfied with the health screening with a 90% response rate (29 out of 32 participants completed the evaluation). Participants strongly agreed (79.3%) or agreed (20.7%) that they were satisfied with the types of screenings provided, while 65.5% strongly agreed and 34.5% agreed that they were satisfied with the amount of time it took to complete the health screening. One of the survey items evaluated participants' satisfaction with the amount of time to complete the REACH survey. Overall, 62.1% of respondents strongly agreed, 31% agreed, and 3.4% disagreed with being satisfied with the amount of time to complete the survey. One participant did not respond to this item. Participants strongly agreed (72.4%) or agreed (27.6%) that their health screening results were explained to them. All participants who responded indicated that they felt comfortable asking questions, and they understood their health screening results. Notably, all participants who completed the participant evaluation indicated that they would participate in future health screenings and were satisfied with their health screening experience.

Physical activity levels reported

Twenty-eight women responded to the moderate-intensity PA survey item. Nineteen women (59.4%) reported participating in moderate-intensity PA. Of 29 participants responding to the vigorous-intensity PA survey item, 10 (31.3%) reported participating in vigorous-intensity PA. The mean daily PA participation was 51.0 minutes for moderate-intensity and 32.7 minutes for vigorous-intensity, respectively. Based on AHA recommendations, 5 women (15.6%) met moderate-intensity and 5 women (15.6%) met vigorous-intensity PA recommendations. There

were a total of 9 women meeting AHA recommendations, one participant met both moderate-intensity and vigorous-intensity PA recommendations.

CMR factors

Seven (21.9%) women reported a history of diabetes and 14 (43.8%) reported a history of hyperlipidemia (Table 1). A1C levels $> 7\%$ are considered elevated for persons with diabetes and levels $\geq 5.7\%$ are considered elevated for those without diabetes. The mean A1C level for women with a history of diabetes was 6.7. Further, two women with a history of diabetes had an elevated A1C level (A1C $> 7\%$). The mean A1C level for women without a history of diabetes was 5.6%. There were 23 women without a history of diabetes, and 11 of the 23 had an elevated A1C level ($\geq 5.7\%$). Two (6.3%) women reported a history of prediabetes. Hypertension was self-reported by 22 (68.8%) women, with 19 of those 22 (59.4%) women currently taking blood pressure medications. Six women reported a history of diabetes and hypertension, while 2 of these women also reported a history of high cholesterol. The majority of participants were obese (68.8%), and most participants (80.6%) had an increased waist circumference. Two (6.3%) women reported a history of stroke. Table 2 provides additional information regarding CMR factors.

Relationship between PA level and CMR factors

Differences in CMR factors between participants meeting and not meeting AHA recommendations were examined using Mann-Whitney tests. Systolic blood pressure for those meeting moderate-intensity recommendations (Median = 146) was significantly higher than those not meeting moderate-intensity recommendations (Median = 133.5; $U = 25.0$; $p = .031$, Table 3). Similarly, diastolic blood pressure for those meeting moderate-intensity

recommendations (Median= 99) was significantly higher than those not meeting moderate-intensity recommendations (Median = 82.5; $U = 20.0$; $p = .013$. No statistically significant differences in CMR factors for those meeting and not meeting vigorous-intensity PA recommendations were observed in this sample. Tables 3 and 4 report Mann-Whitney test results for moderate and vigorous PA, respectively.

Discussion

The current study examined the feasibility, acceptability, and implementation of community-based screening. It is important to note that there are limitations with this study. One limitation is the sample size. Additional research with a larger sample size is warranted. Although the recruitment goal was not met, this feasibility study provided valuable insight into recruitment in this geographic region. Further, this feasibility study established new community partnerships and enhanced those already established. One of the health screening events held at a local African American church is an annual event sponsored by multiple community partners. Overall participation in the health event was lower than the previous year's attendance, which could be attributed to weather conditions on this particular day. Factors to consider for future recruitment include collaborating with community partners and providing health screenings in conjunction with another community event. An additional factor that may have contributed to the low sample size for in this study is the location of the site within the community. Future health events held in areas where community members can have better access should be considered, particularly for individuals with barriers to transportation. A second limitation is the results may not be generalized to residents in other geographic locations. Recruitment strategies and participation rates may vary from one geographic region to another. A third limitation is the

use of self-report data. Although surveys are a useful method for collecting data, it is important to note that self-report surveys have the potential for recall errors or for eliciting responses that are socially desirable (Dilorio, 2005). Potential recall errors may include over reporting or under reporting of self-reported data (Dilorio, 2005). Although self-reporting PA data may be considered a limitation due to possible recall errors, research has indicated that objective measures of PA may not be more strongly associated with cardiovascular health compared to self-report measures (Schmidt, Cleland, Thomson, Dwyer, & Venn, 2008).

The current feasibility study had several strengths. First, the health screenings were all held within the local community with two events held in African American churches and one in a local senior center. Although there were various forms of advertisement for the health events, most participants indicated they learned about the event directly from the site. For example, flyers and announcements made during church services were a common method of promoting the health screening events. Churches have been sites for study recruitment and implementation of health promotion programs targeting various behaviors. Previous research indicates that churches are an ideal site for health promotion in African Americans (Banks-Wallace & Conn, 2002; Peterson & Cheng, 2011). The health screenings provided an opportunity to build new community partnerships and to continue developing previously established partnerships. The third health screening in particular had several community partners who are involved in this annual event. Health screenings also included the use of a modified version of the REACH Risk factor survey. The surveys were used by health screening personnel to assess participants for various risk factors. Survey items included information regarding past medical diagnoses such as diabetes, stroke, CVD, hypertension, and high cholesterol. Participants also responded to

survey items regarding health promoting behaviors. Health screening education for each participant focused on results of objective measures as well as risk factors identified in the survey. Most participants indicated that they were satisfied with the amount of time to complete the survey. An additional strength of this feasibility study was the positive feedback from participants, health screening volunteers/personnel, and representatives for each site.

The study also examined PA levels and CMR among AAW in a rural Southeastern region not previously covered by REACH. Cardiometabolic risk factors are personal factors that may be influenced by health promoting behaviors such as not smoking, fruit and vegetable consumption, and PA. African American women typically have a lower percentage for meeting PA recommendations when compared to other ethnic/gender groups (Go et al., 2014). In an analysis of stroke and heart disease statistics, 35.5% of AAW met PA guidelines compared to 47.5% for African American men, 50.9% for non-Hispanic White women, and 56.4% for non-Hispanic White men (Go et al., 2014). Research indicates that PA is a protective factor that decreases an individual's likelihood of developing CVD (Shiroma & Lee, 2010). In the present study, 15.6% met moderate-intensity PA, and 15.6% met vigorous-intensity PA recommendations. Another protective factor, HDL, was examined in a 20 year cohort study. Hirata et al. (2016) examined the effect of a very high level of HDL on coronary heart disease (CHD) and other cause-specific mortality. Interestingly, no association was observed between HDL levels and all-cause and stroke mortality. However, HDL was protective against CHD when levels were up to 2.06 mmol/L (80mg/dL). Levels higher than 2.06 mmol/L (80mg/dL) were identified as not protective. Another study examined HDL levels greater than 75mg/dL in women and indicated that the risk of CHD was not further reduced by high levels of HDL

(Wilkins et al., 2014). In the present study, HDL levels ranged from 30 to 77 mg/dL, with 50% of participants having a level 50 mg/dL or higher. In addition to HDL levels, blood pressure is another factor associated with the likelihood of developing CVD. Previous studies have indicated a significant decrease in systolic blood pressure with PA participation (Duru, Sarkisian, Leng, & Mangione, 2010; Wilson, Porter, Parker, & Kilpatrick, 2005; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). Interestingly, both systolic blood pressure and diastolic blood pressure were higher for those meeting AHA recommendations for moderate-intensity versus those who did not meet recommendations. It is important to note that there may be factors contributing to this finding. Data obtained for this study did not include information regarding how long participants have been physically active. It is very possible that participants started participating in PA due to prior elevated blood pressure readings. For women who recently started becoming physically active, their current blood pressure readings may not yet reflect this increase in PA or their blood pressure readings may have actually been higher. It is also important to note that women not meeting AHA recommendations were older, had a higher HDL, and had lower BMI, waist circumference, LDL, and triglycerides compared to women who met moderate-intensity PA recommendations. Further, four of the women who met AHA recommendations had a history of hypertension. Three of the four women were currently taking medication for hypertension. Additional research examining CMR and protective factors among AAW is warranted.

In addition to PA, the study examined two other health promoting behaviors; fruit and vegetable consumption and not smoking. African Americans typically do not consume the recommended daily intake of fruits and vegetables (Backman et al., 2011; L. Johnson, Ralston, & Jones, 2010). In the present study, 62.5% of participants consumed less than 1 fruit per day

and 56.3% consumed less than one vegetable per day. Low fruit and vegetable consumption may be attributed to various factors including access to quality, affordable fresh fruits and vegetables. Similar to previous findings (King et al., 2006), most participants (78.1%) reported that they have never smoked. King et al., (2006) reported that AAW living in the south were more likely to never have smoked compared to AAW living in northeast states. Further, AAW typically have a lower prevalence of smoking (14.9%) when compared to other gender/ethnic groups including African American men (22.5%), non-Hispanic White women (19.2%), and non-Hispanic White men (22.1%) (CDC, 2015a). The high percentage of AAW who have never smoked is similar to rates found in Charleston/Georgetown South Carolina counties covered by REACH data. Additional similarities between rural upstate South Carolina and self-reported survey data in Charleston/Georgetown include rates of self-reported health conditions and overweight/obesity. Participants in this feasibility study self-reported a history of hypertension (68.8%) followed by hyperlipidemia (43.8%) and diabetes (21.9%). These findings are similar to REACH Risk Factor self-reported survey data from Charleston/Georgetown counties. Further, in both Charleston/Georgetown and rural upstate South Carolina, more women were outside the normal BMI range.

Studies that include health screenings for CMR have implications for clinicians. Early identification of CMR allows for early intervention. Early intervention may include strategies to prevent CVD, stroke, diabetes, or further complications for those already diagnosed with these conditions. Microalbumin screenings are useful to detect microalbuminuria, an early indicator of CKD. Further, screenings allow clinicians to identify persons with prediabetes and begin early intervention. Without early intervention, persons with prediabetes are likely to develop diabetes

(Centers for Disease Control and Prevention, 2015). Strategies that promote lifestyle modification can be initiated as a result of early identification of risk factors obtained during community-based screenings. A recent integrative review found promising strategies targeting PA among AAW that warrant additional research (source deleted for blinded review). Strategies to improve PA, including faith-based, culturally tailored, and social support, have provided significant results related to CMR factors (Duru et al., 2010; source deleted for blinded review; Wilson et al., 2005; Yanek et al., 2001).

Conclusion

African American women have a low rate of meeting PA recommendations and a high rate of obesity and other CMR factors. Similar findings were identified in this feasibility study. Health promoting behaviors such as PA, healthy eating habits, and not smoking can decrease the risk of certain personal factors thereby decreasing CMR. Findings from this study indicate the need for further study of PA levels and CMR among this population, particularly with a larger sample size. Findings from this study and future studies may be useful for health care providers, including nurses, in the early identification of CMR factors that may affect the likelihood of an individual developing a chronic health condition such as CVD, stroke, or diabetes.

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Table 1. Demographic and survey information for participants

Characteristic	Mean or N	SD or %
Age (mean)	57.2	14.9
Education (highest level completed)		
<i>Some Elementary</i>	1	3.1
<i>Some high school</i>	2	12.5
<i>High school graduate</i>	10	31.3
<i>Some college</i>	6	18.8
<i>College graduate</i>	8	25
Health Insurance (yes)	26	81.3
Employment Status		
<i>Employed or Self-employed</i>	9	28.1
<i>Retired</i>	16	50.0
<i>Out of work/unable to work</i>	5	15.6
Income		
< \$10,000	7	21.9
\$10,001 to < \$35,000	9	28.1
≥ \$35,000	8	25.0
Self-Reported:		
<i>Diabetes</i>	7	21.9

<i>Prediabetes</i>	2	6.3
<i>Stroke</i>	2	6.3
<i>Hypertension</i>	22	68.8
<i>Hyperlipidemia</i>	14	43.8
Smoking status		
<i>Current Smoker</i>	3	9.4
<i>Former Smoker</i>	4	12.5
<i>Never Smoked</i>	25	78.1
Fruit Intake		
<i>Less than 1 per day</i>	20	62.5
<i>1 to 2 per day</i>	9	28.1
<i>3 or more per day</i>	3	9.4
Vegetable Intake		
<i>Less than 1 per day</i>	18	56.3
<i>1 to 2 per day</i>	7	21.9
<i>3 or more per day</i>	7	21.9

Table 2. Screening results					
	Mean	SD	Range	Normal Range	Out of normal range N
Systolic blood pressure (mm Hg)	136.7	22.8	97 – 185	< 120	24
Diastolic blood pressure (mm Hg)	85.9	14.8	53 – 132	< 80	20
Weight (lbs.)	209.0	59.2	119 – 394	na	
Body mass index (kg/m ²)	36.0	9.0	24.4 – 60.0	18.5-24.9	31*
Waist Circumference (cm)	42.0	7.5	31 – 62.5	< 35	26
Total Cholesterol (mg/dL)	181.3	38.3	123 – 275	< 200	8
LDL (mg/dL)	107.9	34.5	43 – 193	< 150	1
HDL(mg/dL)	50.1	12.5	30 – 77	≥ 50	16
Triglycerides(mg/dL)	121.2	47.1	53 – 214	< 190	10
Fasting Glucose (mg/dL)	88.1	11.2	66 -111	70-100	1
Random Glucose (mg/dL)	131.0	60.6	82 – 253	<130	3
A1C (%)	5.8	0.7	4.6 – 7.7	< 5.7	18**
Microalbumin (mg/L)	47.2	45.7	10 - 150	< 30	12

**9 women were overweight and 22 were obese; **7 of these participants had a self-reported history of diabetes and 2 had a level above 7% (levels >7% is considered elevated for those with a history of diabetes)*

Table 3. Objectively measured cardiometabolic risk for participants meeting and not meeting AHA moderate-intensity aerobic physical activity recommendations

	Moderate Physical Activity Not Met (n= 26)			Moderate Physical Activity Met (n= 5)				
	Mean	SD	Median	Mean	SD	Median	U- statistic*	p-value
Age	57.9	13.9	63.0	52.4	21.6	46.0	82.5	0.275
Weight	207.2	58.7	197.0	219.3	73.9	221.0	58.0	0.735
BMI	35.8	9.1	34.2	37.3	10.1	35.6	56.0	0.658
Waist circumference	41.6	6.9	41.3	45.4	12.1	42.5	40.0	0.498
A1C	5.8	0.8	5.8	5.9	0.4	5.7	59.0	0.775
HDL	51.4	12.6	50.5	43.6	12.5	47.0	88.5	0.214
LDL	103.8	32.6	98.0	132.0	41.1	114.0	40.0	0.195
Triglycerides	118.4	46.5	111.0	149.4	38.5	169.0	39.0	0.176
Systolic blood pressure	133.9	23.4	133.5	152.8	14.5	146.0	25.0	0.031**
Diastolic blood pressure	84.4	15.3	82.5	96.6	5.6	99.0	20.0	0.013**

*From Mann-Whitney-test; **Significant at the 0.05 level

Table 4. Objectively measured cardiometabolic risk for participants meeting and not meeting AHA vigorous-intensity aerobic physical activity recommendations

	Vigorous Physical Activity Not Met (n= 24)			Vigorous Physical Activity Met (n= 5)				
	Mean	SD	Median	Mean	SD	Median	U- statistic*	p-value
Age	54.2	14.8	58.0	65.8	7.6	64.0	32.0	0.137
Weight	209.9	64.3	197.0	225.4	39.7	221.0	41.5	0.295
BMI	36.5	9.7	34.8	36.3	6.9	37.2	56.0	0.845
Waist circumference	42.0	7.7	41.2	43.9	7.1	42.0	49.0	0.556
A1C	5.6	0.7	5.8	5.8	0.4	5.4	69.5	0.594
HDL	50.4	12.3	48.5	50.8	14.7	52.0	59.0	0.978
LDL	114.1	35.4	110.0	83.8	29.8	96.0	85.0	0.162
Triglycerides	125.2	46.1	120.0	119.0	57.9	110.0	65.0	0.801
Systolic blood pressure	133.8	23.6	134.0	142.2	16.6	138	45.5	0.414
Diastolic blood pressure	85.3	16.2	82.5	88.0	9.5	88.0	48.0	0.518

*From Mann-Whitney-test; **Significant at the 0.05 level

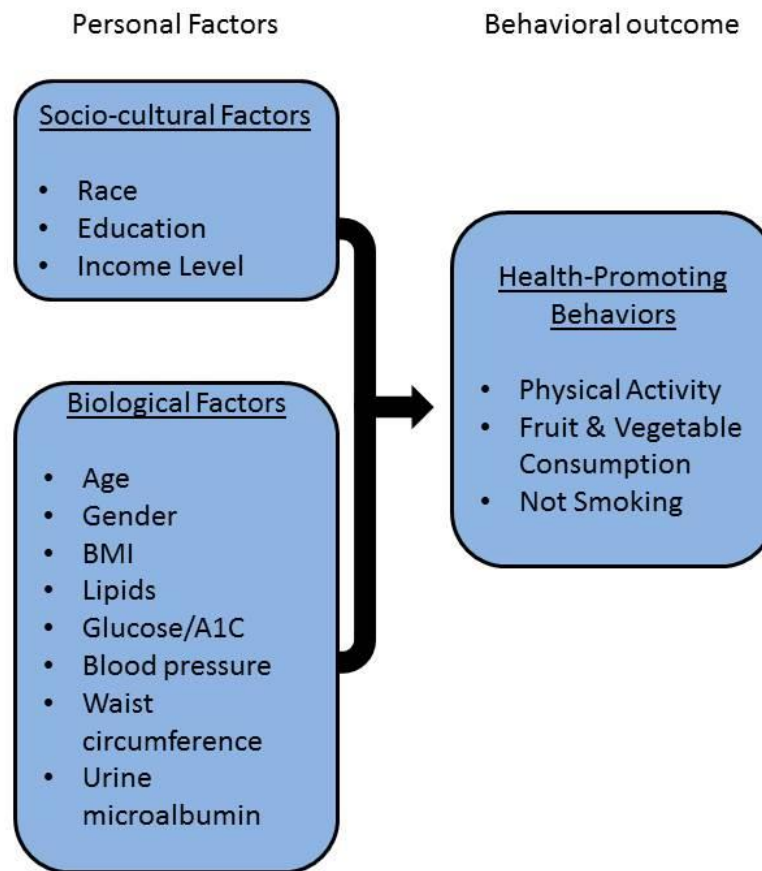


Figure 1. Specific Health Promotion Model concepts used for the present study
Modified from (Sakraida, 2014)

Brief Overview

Findings from the integrative review exploring studies promoting PA among AAW revealed notable gaps in the published literature (Jenkins, Jenkins, Gregoski, & Magwood, 2016). First, several studies examined PA outcomes without examining the influence of PA on CMR factors, such as BMI. It is important to note that several studies focused solely on increasing PA. Studies that did examine PA and BMI and/or weight in the integrative review revealed mixed findings. Both significant and nonsignificant differences in BMI/weight were reported among the studies promoting PA. Although older adults are less likely to meet PA recommendations compared to younger adults (Centers for Disease Control and Prevention, 2014), few studies have examined PA strategies while focusing on older AAW. Thirdly, many studies did not include a follow-up period beyond the post-intervention measurements. Further, the integrative review revealed that many studies included a small sample size and did not include a randomized controlled design or comparison group.

Given that few studies have examined PA levels and the association of PA and CMR among AAW, the purpose of this dissertation was to add to the current state of science. This dissertation compendium contributes to the overarching research questions: What levels of PA are reported by AAW? What is the relationship between PA levels and self-reported 1) diabetes, 2) weight/body mass index (BMI), 3) hypertension and 4) hyperlipidemia among a sample of southern AAW? 2. What are the levels of PA and CMR factors in a sample of AAW in Upstate, SC? 3. What is the feasibility of CMR screening, participant recruitment, and lifestyle assessment using a modified version of the REACH survey among a sample of AAW in Upstate, South Carolina? AAW typically have a low percentage of meeting recommendations for health-

promoting behaviors such as PA and fruit/vegetable consumption (Backman et al., 2011; Go et al., 2014) as well as higher rates of hypertension and obesity, two contributing factors for CMR. This dissertation revealed similar findings with most participants in both studies not meeting recommendations for PA or fruit/vegetable consumption.

The secondary analysis and health screening study revealed nonsignificant findings regarding the association of PA and BMI. Among AAW in the secondary analysis and health screening study, there was a significant association between blood pressure and PA. In the secondary analysis, women without a self-reported history of hypertension were more likely to meet moderate-intensity and vigorous-intensity PA than women with a self-reported history of hypertension. Interestingly, in the health screening study women meeting moderate-intensity PA recommendations were more likely to have a higher systolic and diastolic blood pressure. This finding may be contributed to several factors as discussed in manuscript three. Overall, this dissertation revealed the importance of promoting healthy behaviors to reduce CMR. It is essential to increase awareness and address health disparities regarding recommendations for PA and fruit/vegetable consumption as well as provide effective strategies for AAW.

Importance of Health Promotion Model

Prior research studies focusing on AAW and lifestyle behaviors, such as PA, have utilized HPM (Anderson & Pullen, 2013; Buchholz & Artinian, 2009). The HPM was essential as the guiding framework for the secondary analysis and health screening feasibility study. In the present studies, individual characteristics and behavioral outcomes were the focus. Individual characteristics referred to personal factors such as blood pressure and levels for glucose/A1C and lipids. Behavioral outcomes referred to health-promoting behaviors including PA, consuming

fruits/vegetables, and not smoking. The research questions focused on personal factors and behavioral outcomes (Figure 1), as well as the association between personal factors and behavioral outcomes. Further, the HPM is useful to examine CMR (Figure 2). CMR includes biological factors (personal factors) including abnormal lipids, overweight/obesity, and increased glucose and blood pressure. CMR also includes lifestyle behaviors that influence the risk of developing CVD. This dissertation also expanded the CMR profile by incorporating microalbuminuria as a risk factor (Klausen, Scharling, & Jensen, 2006). Microalbuminuria has gained attention as a marker for CVD (Currie & Delles, 2013; Jarraya et al., 2013; Weir, 2007), and it is an early indicator of chronic kidney disease (CKD) (Jarraya et al., 2013). Including the feasibility of screening for microalbuminuria was essential given the increased risk of CVD for AAW with CMR factors. AAW with a history of hypertension or diabetes were screened for microalbuminuria (U.S. Preventive Services Task Force, 2014). Microalbuminuria is associated with increased likelihood of progression of CKD (Glasscock, 2010; Jarraya et al., 2013). Thus, considering the HPM, CMR including microalbuminuria were important personal factors to examine among AAW.

Limitations

Detailed descriptions of limitations are discussed within each manuscript (Jenkins, Magwood, Mueller, Gibson et al., 2016; Jenkins, Magwood, Mueller, Gregoski, et al., 2016). Briefly, the integrative review did not include abstracts, dissertations, or studies referenced in other databases. Thus, it is possible that studies promoting PA among AAW were not included in the integrative review. A limitation for the second and third manuscripts is the use of self-reported data, which are subject to potential recall errors and participants' providing socially

desirable responses (Dilorio, 2005). Further, a small sample size was identified as a limitation in the third manuscript. However, several lessons were reiterated, including the importance of collaborating with community partners, holding community events in locations where individuals without transportation will have easier access, and having health screenings in collaboration with other community events to increase participation.

Research trajectory/Next steps

Future steps include disseminating findings from this dissertation through various professional and community venues. Findings will be shared with the participating community organizations. AAW have a high prevalence of CVD, diabetes, and mortality from both of these chronic health conditions. Health-promoting strategies are needed to prevent or mitigate the incidence of these chronic health conditions in AAW. The health screening feasibility study indicated that AAW participating in the study had a high rate of obesity and hypertension, and a low rate for meeting recommendations for PA and fruit and vegetable intake. Thus, suggested future steps include community based participatory research focusing on identifying CMR and promoting lifestyle behaviors including meeting PA and fruit/vegetable intake recommendations. A pilot study to examine intervention implementation, recruitment, and retention is suggested. Future studies with a longer follow-up period beyond the post-intervention measurements are needed to examine long-term outcomes and sustainability of PA behavior change. Finally, another suggestion is including objective PA measures alone or in addition to self-report PA measures. The integrative review revealed that most studies included self-report PA measures. Based on findings from the integrative review, future research might also include a randomized controlled trial intervention.

Contribution of Research to Science and Nursing

This dissertation contributes to the current state of science regarding PA and CMR among AAW by including findings regarding PA levels among AAW. This dissertation also provides findings regarding the association of PA and CMR among AAW, an understudied population in PA and CMR research. The findings support the need for more focus on promoting healthy behaviors such as PA and increasing fruit/vegetable consumption among AAW. Nurses are essential health care team members and are well positioned to promote healthy behaviors, lead efforts to increase awareness, and reduce the risk of health conditions associated with not participating in healthy behaviors. Further, health care providers have a key role in providing health screenings for CMR risk factors and engaging AAW who are at risk. Collaborating with rural communities to increase awareness of CMR and PA recommendations is needed to decrease the prevalence of CMR, CVD, stroke, and diabetes. Finally, this study addressed providing health screenings for early diagnosis and intervention; health care providers are in a prime position to provide health education and recommend realistic strategies for increasing lifestyle behaviors to reduce risk factors identified during health screenings. The importance of prevention and health promotion within the scope of nursing education, healthcare, and public health is essential for reducing CMR. CMR screenings allow for early identification of factors that increase the risk of CVD, stroke, and diabetes. Furthermore, consistent with the current call to improve cardiovascular health by preventing and detecting risk factors and using PA to improve health and quality of life (U.S. Department of Health and Human Services, 2016a, 2016b), it is essential for nurses and public health professionals to focus on AAW due to their existing health disparities. In addition to identifying CMR factors to

prevent CVD and promote quality of life in individuals, this health information is also beneficial for policy makers at the population level (VanWormer et al., 2012). Policy makers and public health professionals can develop strategies to promote PA among AAW in multiple communities. Targeted strategies should also consider any existing disparities between rural and urban communities.

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Office of Research Integrity
19 Hagood Ave, Suite 601, MSC857
Charleston, SC, 29425
Tel: 843 792 4148 • Fax: 843 792 7457



June 30, 2015

To: Felicia Jenkins
Department of Nursing

From: Mark Hamner, MD
Chair, IRB I

Re: Not Human Subjects Determination

This memo is in response to the submitted Not Human Research (NHR) application, *"Physical Activity and Cardiometabolic Risk Factors among African American Women Residing in the Southeastern United States (Pro 45151)"*.

Based on your application, this project meets the Not Human Research criteria set forth by the Code of Federal Regulations (45CFR46) of:

- a. The Specimens and/or private information/data were not collected specifically for the currently proposed research project through an interaction/intervention with living individuals AND
- b. The investigator(s) including collaborators on the proposed research cannot readily ascertain the identity of the individual(s) to whom the coded private information of specimens pertains.

Therefore, this project has been deemed not to be human research and is not subject to oversight by the Medical University of South Carolina IRB. If there are any changes to the application you provided, please resubmit for a NHR determination.

"An equal opportunity employer, promoting workplace diversity."



**Institutional Review Board for Human Research (IRB)
Office of Research Integrity (ORI)
Medical University of South Carolina**

**Harborview Office Tower
19 Hagood Ave., Suite 601, MSC857
Charleston, SC 29425-8570
Federal Wide Assurance # 1888**

APPROVAL:

This is to certify that the research proposal Pro00045327 entitled:
Physical Activity and Cardiometabolic Risk Factors Among African American Women residing in the Southeastern United States: A feasibility study

Submitted by: Felicia Jenkins
Department: Medical University of South Carolina

for consideration has been reviewed by IRB-I - Medical University of South Carolina and approved with respect to the study of human subjects as adequately protecting the rights and welfare of the individuals involved, employing adequate methods of securing informed consent from these individuals and not involving undue risk in the light of potential benefits to be derived therefrom. No IRB member who has a conflicting interest was involved in the review or approval of this study, except to provide information as requested by the IRB.

Original Approval Date: 7/2/2015
Approval Expiration: 7/1/2016

Type: Expedited

Chair, IRB-I - Medical University of South Carolina
Mark Hamner*

Statement of Principal Investigator:

As previously signed and certified, I understand that approval of this research involving human subjects is contingent upon my agreement:

1. To report to the Institutional Review Board for Human Research (IRB) any adverse events or research related injuries which might occur in relation to the human research. I have read and will comply with IRB reporting requirements for adverse events.
2. To submit in writing for prior IRB approval any alterations to the plan of human research.
3. To submit timely continuing review reports of this research as requested by the IRB.
4. To maintain copies of all pertinent information related to the research activities in this project, including copies of informed consent agreements obtained from all participants.
5. To notify the IRB immediately upon the termination of this project, and/or the departure of the principal investigator from this Institution and the project.

**Electronic Signature: This document has been electronically signed by the IRB Chairman through the HSSC eIRB Submission System authorizing IRB approval for this study as described in this letter.*



Institutional Review Board for Human Research (IRB)
Office of Research Integrity (ORI)
Medical University of South Carolina

Harborview Office Tower
19 Hagood Ave., Suite 601, MSC857
Charleston, SC 29425-8570
Federal Wide Assurance # 1888

APPROVAL: Protocol: MS1_Pro00045327
MUSC Amendment #: Ame1_Pro00045327
Amendment Title: Amendment 1 for IRB Study #Pro00045327
Sponsor Amendment #:
Version Date:

This is to certify that the amendment to the research proposal entitled:
Physical Activity and Cardiometabolic Risk Factors Among African American Women residing in the
Southeastern United States: A feasibility study

Submitted by: Felicia Jenkins
Department: Medical University of South Carolina
Sponsor: null, The health screening is part of the the National Chronic Disease Screening Program: Screening
for Diabetes in Underserved Rural Communities in South Carolina that is funded by Sanofi.

for consideration has been reviewed by IRB-I - Medical University of South Carolina and approved with respect to the study of human subjects as adequately protecting the rights and welfare of individuals involved, employing adequate methods of securing informed consent from these individuals and not involving undue risk in the light of potential benefits to be derived therefrom. No IRB member who has a conflicting interest was involved in the review or approval of this amendment, except to provide information as requested by the IRB. If this amendment required a change in the currently approved Informed Consent, then all previous Informed Consent documents should be marked obsolete.

Approval Date: 9/9/2015

Amendment Type: Expedited

Chair IRB I,
Mark Hamner, MD

* *Electronic Signature: This document has been electronically signed by the IRB Chairman through the HSSC eIRB Submission System authorizing IRB approval for this study as described in this letter.*

**Medical University of South Carolina
CONSENT TO BE A RESEARCH SUBJECT**

TITLE OF RESEARCH: Physical Activity and Cardiometabolic Risk Factors among African American women residing in the Southeastern United States: A feasibility study

A. PURPOSE OF THE RESEARCH

You are being asked to volunteer for a research study. Research studies are voluntary and include only people who choose to take part. Please read this consent form carefully and take your time making your decision. As your study staff discusses this consent form with you, please ask her to explain any words or information that you do not clearly understand. The purpose of this study is to examine levels of physical activity and cardiometabolic risk factors (i.e. glucose, cholesterol, weight/waist circumference, and blood pressure) among African American women. This study will also examine factors associated with metabolic syndrome (i.e. glucose, cholesterol, weight/waist circumference, blood pressure, and microalbumin). Also, the purpose includes evaluating the feasibility of a community-based health screening. You are being asked to participate in this study because you are an African American woman participating in a community health screening. The investigator in charge of this feasibility study is Felicia Jenkins. The study is being done at three sites in Cherokee county, South Carolina. Approximately 60 people will take part in this study.

B. PROCEDURES

If you agree to be in this study, the following will happen:

1. The researcher will review the results of your surveys and health screening and use these results for research purposes. The REACH Risk Factor survey includes questions regarding your health status and risk factors for certain health conditions (i.e. high blood pressure, heart disease, and diabetes). The survey includes questions about your health, physical activity level, fruit and vegetable intake, etc. The evaluation survey includes results regarding your experience with the health screening process. Health screening results will include blood pressure, waist circumference, height, weight, body mass index (BMI), glucose/A1C, urine microalbumin, and cholesterol levels.

C. DURATION

Participation in the study will take about 15 minutes – 30 minutes.



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D. RISKS AND DISCOMFORTS

There is a risk of a loss of confidentiality of your personal information as a result of participation in this study. To prevent the loss of confidentiality, all study documents will be maintained in a secure location.

E. BENEFITS

There will be no direct benefit to you from participating in this study. However, it is hoped that the information gained from the study will help the researcher learn more about implementing a community health screening, levels of physical activity and cardiometabolic risk factors (i.e. glucose, cholesterol, weight/waist circumference, and blood pressure) among African American women.

F. COSTS

There will be no cost to you as a result of participation in this study.

G. PAYMENT TO PARTICIPANTS

You will not be paid for participating in this study.

H. ALTERNATIVES

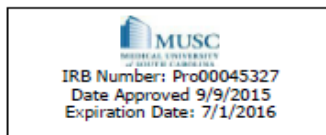
Your alternative is to not participate in this study. You may still participate in the health screening if you do not wish to participate in the study.

I. FUTURE CONTACT

The researcher in charge of this study might like to contact you in the future about other research opportunities. Please initial by your choice below:

____ Yes, I agree to be contacted

____ No, I do not agree to be contacted



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Results of this research will be used for the purposes described in this study. This information may be published, but you will not be identified. Information that is obtained concerning this research that can be identified with you will remain confidential to the extent possible within State and Federal law. The investigators associated with this study, the sponsor, and the MUSC Institutional Review Board for Human Research will have access to identifying information. All records in South Carolina are subject to subpoena by a court of law.

In the event that you are injured as a result of participation in this study, you should immediately go to the emergency room of the Medical University Hospital, or in case of an emergency go to the nearest hospital, and tell the physician on call that you are in a research study. They will call your study doctor who will make arrangements for your treatment. If the study sponsor does not pay for your treatment, the Medical University Hospital and the physicians who render treatment to you will bill your insurance company. If your insurance company denies coverage or insurance is not available, you will be responsible for payment for all services rendered to you.

Your participation in this study is voluntary. You may refuse to take part in or stop taking part in this study at any time. You should call the investigator in charge of this study if you decide to do this. Your decision not to take part in the study will not affect your current or future medical care or any benefits to which you are entitled.

The investigators and/or the sponsor may stop your participation in this study at any time if they decide it is in your best interest. They may also do this if you do not follow the investigator's instructions.

Volunteers Statement

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. If I have any more questions about my participation in this study or study related injury, I may contact Felicia Jenkins (864) 909-9968. I may contact the Medical University of SC Hospital Medical Director (843) 792-9537 concerning medical treatment.

If I have any questions, problems, or concerns, desire further information or wish to offer input, I may contact the Medical University of SC Institutional Review Board for Human Research IRB Manager or the Office of Research Integrity Director at (843) 792-4148. This includes any questions about my rights as a research subject in this study.

I agree to participate in this study. I have been given a copy of this form for my own records. *If you wish to participate, you should sign below.*

Signature of Person Obtaining Consent	Date	Signature of Participant	Date
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MUSC
MEDICAL UNIVERSITY
OF SOUTH CAROLINA
IRB Number: Pro00045327
Date Approved 9/9/2015
Expiration Date: 7/1/2016

Authorization to Use or Disclose (Release) Health Information that Identifies You for a Research Study

If you sign this document, you give permission to the Medical University of South Carolina (MUSC) to use or disclose (release) your health information that identifies you for the research study described here:

Physical Activity and Cardiometabolic Risk Factors among African American women residing in the Southeastern United States: A feasibility study
This study will examine the levels of physical activity and cardiometabolic risk factors (i.e. glucose, cholesterol, weight/waist circumference, and blood pressure) among African American women.

The health information MUSC may use or disclose (release) for this research study includes information in your medical record, results of physical exams, medical history, lab tests or certain health information indicating or relating to your condition.

The health information listed above may be used by and/or disclosed (released) to the following, as applicable:

- The sponsor of the study including its agents such as data repositories or contract research organizations monitoring the study;
- Other institutions and investigators participating in the study;
- Data Safety Monitoring Boards;
- Accrediting agencies;
- Clinical staff not involved in the study whom may become involved if it is relevant;
- Health insurer or payer in order to secure payment for covered treatment;
- Parents of minor children is less than 16 years old. Parents of children 16 years old or older require authorization from the child; or
- Federal and state agencies and MUSC committees having authority over the study such as:
 - The Institutional Review Board (IRB) overseeing this study;
 - Committees with quality improvement responsibilities;
 - Office of Human Research Protections;
 - Food and Drug Administration;
 - National Institutes of Health; or
 - Other governmental offices, such as a public health agency or as required by law.

MUSC is required by law to protect your health information. By signing this document, you authorize MUSC to use and/or disclose (release) your health information for this research. Those persons who receive your health information may not be required by Federal privacy laws (such as the Privacy Rule) to protect it and may share your information with others without your permission, if permitted by laws governing them.

You do not have to sign this authorization. If you choose not to sign, it will not affect your treatment, payment or enrollment in any health plan or affect your eligibility for benefits. However, you will not



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be allowed to be a participant in this research study.

You may change your mind and revoke (take back) this Authorization at any time. Even if you revoke this Authorization, MUSC may still use or disclose (release) health information already obtained about you as necessary to maintain the integrity or reliability of the research study. If you revoke this Authorization, you may no longer be allowed to participate in this research study. To revoke this Authorization, you must write to:

Felicia Jenkins
P.O. Box 157
Roebuck, SC 29376

You will not be allowed to see or copy the information described on this Authorization as long as the research study is in progress. When the study is complete, you have a right to see and obtain a copy of the information.

Your health information will be used or disclosed when required by law. Your health information may be shared with a public health authority that is authorized by law to collect or receive such information for the purpose of preventing or controlling disease, injury or disability and for conducting public health surveillance, investigations or interventions. No publication or public presentation about the research study will reveal your identity without another signed authorization from you.

You will be given a copy of this Authorization. This Authorization will expire at the end of the research study. If you have questions or concerns about this Authorization or your privacy rights, please contact MUSC's Privacy Officer at 843-792-8740.

Regulations require that you be given a copy of the MUSC Notice of Privacy Practices (NPP) describing the practices of MUSC regarding your health information. One can be found at the end of this form.

[SIGNATURE PAGE TO FOLLOW]



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Signature of Research Participant ages 16 & above*

Date _____

Signature of Research Participant's Legally Authorized Representative
(if applicable)

Date _____

Printed Name of Research Participant

Printed Name of Research Participant's Legally Authorized Representative (if applicable)

Representative's Relationship to Research Subject

*If the research participant is 16 to 18 years of age, signatures of both the research participant and the Legally Authorized Representative are required.



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NOTICE OF PRIVACY PRACTICES

MUSC Organized Health Care Arrangement (OHCA)

THIS NOTICE DESCRIBES HOW MEDICAL INFORMATION ABOUT YOU MAY BE USED AND DISCLOSED AND HOW YOU CAN GET ACCESS TO THIS INFORMATION. PLEASE REVIEW IT CAREFULLY.

The Medical University of South Carolina and its affiliates (including but not limited to the Medical University Hospital Authority, MUSC Physicians, and MUSC Physicians Primary Care) participate in a clinically integrated health care setting. As a result of this clinical integration, these organizations function as an Organized Health Care Arrangement (OHCA) as defined by the Health Insurance Portability and Accountability Act (HIPAA). For purposes of this notice, the members of the MUSC OHCA are collectively referred to in this document as "MUSC." We collect or receive this information about your past, present or future health condition to provide health care to you, to receive payment for this health care, or to operate the hospital and/or clinics.

HOW WE MAY USE AND RELEASE YOUR PROTECTED HEALTH INFORMATION (PHI)

A. The following uses do NOT require your authorization, except where required by SC law:

1. **For treatment.** Your PHI may be discussed by caregivers to determine your plan of care. For example, the physicians, nurses, medical students and other health care personnel may share PHI in order to coordinate the services you may need.
2. **To obtain payment.** We may use and disclose PHI to obtain payment for our services from you, an insurance company or a third party. For example, we may use the information to send a claim to your insurance company.
3. **For health care operations.** We may use and disclose PHI for hospital and/or clinic operations. For example, we may use the information to review our treatment and services and to evaluate the performance of our staff in caring for you.
4. **For public health activities.** We report to public health authorities, as required by law, information regarding births, deaths, various diseases, reactions to medications and medical products.
5. **Victims of abuse, neglect, domestic violence.** Your PHI may be released, as required by law, to the South Carolina Department of Social Services when cases of abuse and neglect are suspected.
6. **Health oversight activities.** We will release information for federal or state audits, civil, administrative or criminal investigations, inspections, licensure or disciplinary actions, as required by law.
7. **Judicial and administrative proceedings.** Your PHI may be released in response to a subpoena or court order.
8. **Law enforcement or national security purposes.** Your PHI may be released as part of an investigation by law enforcement.
9. **Uses and disclosures about patients who have died.** We provide coroners, medical examiners and funeral directors necessary information related to an individual's death.
10. **For purposes of organ donation.** As required by law, we will notify organ procurement organizations to assist them in organ, eye or tissue donation and transplants.
11. **Research.** We may use your PHI if the Institutional Review Board (IRB) for research reviews, approves and establishes safeguards to ensure privacy.



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12. To avoid harm. In order to avoid a serious threat to the health or safety of a person or the public, we may release limited information to law enforcement personnel or persons able to prevent or lessen such harm.

13. For workers compensation purposes. We may release your PHI to comply with workers compensation laws.

14. Marketing. We may send you information on the latest treatment, support groups and other resources affecting your health.

15. Fundraising activities. We may use your PHI to communicate with you to raise funds to support health care services and educational programs we provide to the community. You have the right to opt out of receiving fundraising communications with each solicitation.

16. Appointment reminders and health-related benefits and services. We may contact you with a reminder that you have an appointment.

B. You may object to the following uses of PHI:

1. Hospital directories. Unless you object, we may include your name, location, general condition and religious affiliation in our patient directory for use by clergy and visitors who ask for you by name.

2. Information shared with family, friends or others. Unless you object, we may release your PHI to a family member, friend, or other person involved with your care or the payment for your care.

3. Health plan. You have the right to request that we not disclose certain PHI to your health plan for health services or items when you pay for those services or items in full.

C. Your prior written authorization is required (to release your PHI) in the following situations:

You may revoke your authorization by submitting a written notice to the privacy contact identified below. If we have a written authorization to release your PHI, it may occur before we receive your revocation

1. Any uses or disclosures beyond treatment, payment or healthcare operations and not specified in parts A & B above.

2. Psychotherapy notes.

3. Any circumstance where we seek to sell your information.

WHAT RIGHTS YOU HAVE REGARDING YOUR PHI

Although your health record is the physical property of MUSC, the information belongs to you, and you have the following rights with respect to your PHI:

A. The Right to Request Limits on How We Use and Release Your PHI. You have the right to ask that we limit how we use and release your PHI. We will consider your request, but we are not always legally required to accept it. If we accept your request, we will put any limits in writing and abide by them except in emergency situations. Your request must be in writing and state (1) the information you want to limit; (2) whether you want to limit our use, disclosure or both; (3) to whom you want the limits to apply, for example, disclosures to your spouse; and (4) an expiration date.

B. The Right to Choose How We Communicate PHI with You. You have the right to request that we communicate with you about PHI in a certain way or at a certain location (for example, sending information to your work address rather than your home address). You must make your request in writing and specify how and where you wish to be contacted. We will accommodate reasonable requests.

C. The Right to See and Get Copies of Your PHI. You have the right to inspect and receive a copy of your PHI (including an electronic copy), which is contained in a designated record set that may be used to make decisions about your care. You must submit your request in writing. If you request a copy of this information, we may charge a fee for copying, mailing or other costs associated with your request. We may deny your request to inspect and receive a copy in


 IRB Number: Pro00045327
 Date Approved 7/2/2015

Standard HIPAA Authorization

certain very limited circumstances. If you are denied access to PHI, you may request that the denial be reviewed.

D. The Right to Get a List of Instances of When and to Whom We Have Disclosed Your PHI. This list may not include uses such as those made for treatment, payment, or health care operations, directly to you, to your family, or in our facility directory as described above in this Notice of Privacy Practices. This list also may not include uses for which a signed authorization has been received or disclosures made more than six years prior to the date of your request.

E. The Right to Amend Your PHI. If you believe there is a mistake in your PHI or that a piece of important information is missing, you have the right to request that we amend the existing information or add the missing information. You must provide the request and your reason for the request in writing. We may deny your request in writing if the PHI is correct and complete or if it originated in another facility's record.

F. The Right to Receive a Paper or Electronic Copy of This Notice: You may ask us to give you a copy of this Notice at any time. For the above requests (and to receive forms) please contact: Health Information Services (Medical Records), Attention: Release of Information / 169 Ashley Avenue / MSC 369 / Charleston, SC 29425. The phone number is (843) 792-3881.

G. The Right to Revoke an Authorization. If you choose to sign an authorization to release your PHI, you can later revoke that authorization in writing. This revocation will stop any future release of your health information except as allowed or required by law.

H. The Right to be Notified of a Breach. If there is a breach of your unsecured PHI, we will notify you of the breach in writing.

HEALTH INFORMATION EXCHANGES

MUSC, along with other health care providers belongs to health information exchanges. These information exchanges are used in the diagnosis and treatment of patients. As a member of these exchanges, MUSC shares certain patient health information with other health care providers. Should you require treatment at another location that is a part of one of these exchanges, that provider may gather historical health information to assist with your treatment. You have the option of saying that this cannot be done. If you choose not to take part in these alliances, please contact the MUSC Privacy Office at 792-4037.

HOW TO COMPLAIN ABOUT OUR PRIVACY PRACTICES

If you think your privacy rights may have been violated, or you disagree with a decision we made about access to your PHI, you may file a complaint with the office listed in the next section of this Notice. Please be assured that you will not be penalized and there will be no retaliation for voicing a concern or filing a complaint. We are committed to the delivery of quality health care in a confidential and private environment.

PERSON TO CONTACT FOR INFORMATION ABOUT THIS NOTICE OR TO COMPLAIN ABOUT OUR PRIVACY PRACTICES

If you have any questions about this Notice or any complaints about our privacy practices please call the Privacy Officer (843) 792-4037, the Privacy Hotline (800) 296-0269, or contact in writing: HIPAA Privacy Officer / 169 Ashley Avenue / MSC 332 / Charleston SC 29425. You also may send a written complaint to the Office of Civil Rights. The address will be provided at your request.

CHANGES TO THIS NOTICE

We reserve the right to change the terms of this Notice at any time. We also reserve the right to make the revised or changed Notice effective for existing as well as future PHI. This Notice will always contain the effective date. You may view this notice and any revisions to it at: <http://www.musc.edu/privacy>.

EFFECTIVE DATE OF THIS NOTICE

This Notice went into effect on April 14, 2003.
Revised September 2013.


MUSC
MEDICAL UNIVERSITY
OF SOUTH CAROLINA
IRB Number: Pro00045327
Date Approved 7/2/2015

MOUNT ARARAT FIRST PENTECOSTAL CHURCH OF AMERICA

PASTOR ELDER D. BREWTON **BISHOP- BISHOP G. LEACH ** FOUNDER LATE MABLE B. COLZIE
CHURCH PHONE 864-489-4268 ADDRESS 125 HOLLY HILL DR. PASTOR HOME PHONE 864-487-3429



CHUCH MOTTO GOD CAN DO ANYHTING BUT FAIL



June 25, 2015

To Whom It May Concern:

This letter is to give consent to Felicia Jenkins and acknowledge support for the health screening event that will be held at our church. We are also aware that Felicia Jenkins will be conducting research for her dissertation. We are aware that she will ask health screening participants to allow their health screening and survey results to be included in her dissertation study.

Sincerely,

Pastor D. Brewton

Pastor D. Brewton

Serving Seniors Since 1972

499 W. Rutledge Avenue • Gaffney, S.C. 29341



Your Local Area Agency On Aging

(864) 489-3868 • FAX (864) 487-2767

September 2, 2015

To: Institutional Review Board

Medical University of South Carolina

This letter is to give consent to Felicia Jenkins and to acknowledge support for the health screening event that will be held at Senior Centers of Cherokee County, Inc. 499 W. Rutledge Ave. Gaffney, S.C. We are also aware that Felicia Jenkins will ask health screening participants to allow their health screening and survey results to be included in her dissertation study.

Sincerely,

Amy Turner, Executive Director

Enjoying The Journey!



Dunton United Methodist Church

320 East Buford Street
Gaffney, SC 29341

August 25, 2015

To: Institutional Review Board

Medical University of South Carolina

This letter is to give consent to Felicia Jenkins and to acknowledge support for the health screening event that will be held at our church, Dunton United Methodist Church located at 320 E. Buford St. Gaffney, SC 29340. The health screening event will include the Living Tobacco Free Coalition Health Fair. We are also aware that Felicia Jenkins will ask health screening participants to allow their health screening and survey results to be included in her dissertation study.

Sincerely,

Herminia Gardner



Diabetes Initiative of South Carolina
Are you at Risk for Developing Diabetes?



I understand that the following tests are used to determine risks for diabetes. I consent to the screening tests listed below. I understand that a blood sample will be obtained. I also understand that there is a possibility of a false-positive or false-negative result. I know these tests are voluntary and without compensation, expectation or promise thereof and consent to be tested, and hereby hold Medical University of South Carolina, the Diabetes Initiative of South Carolina, participating licensed health professionals, their agencies and employees harmless for all claims and actions in connection therewith. I agree to follow-up with a health care provider if tests are abnormal. I give permission to contact me and/or my doctor for follow-up.

Name: _____ Signature of Participant: _____ Witness: _____
 Today's Date: ____/____/____ Date of Birth: ____/____/____ Race/Ethnicity: _____ Gender: _____ Phone: ____-____-____
 Address: _____ Family Doctor: _____ Doctor Location: _____

- Height _____ Weight _____ BMI _____ [] Follow-up needed. Waist Circumference _____ [] Follow-up needed.
- Blood pressure ____/____ [] Normal [] Follow-up needed. Blood pressure is the force of the blood against the walls of the blood vessels. Two levels of blood pressure are measured: the higher, or systolic, occurs when the heart pumps blood into the blood vessels, and the lower, or diastolic, occurs when the heart rests. High blood pressure is considered 140/90 mmHg or higher. See your doctor to determine how to best lower your blood pressure, and what is best blood pressure for you. High blood pressure can damage heart, brain, blood vessels, sexual function, and/or kidneys.
- A1C Test _____% [] Normal [] Pre-Diabetes [] Diabetes This blood test indicates your average blood sugar level for the past 2-3 months. An A1C lower than 5.0 is normal. An A1C between 5.7 and 6.4 is considered prediabetes and 6.5 and above indicate diabetes. Certain conditions can make the A1C test inaccurate so see your doctor/health care provider for more information about A1C value.
- Fasting Blood Glucose _____mg/dL [] Normal [] Follow-up needed. (Food last consumed ____ hours before testing) The goal is to have a fasting blood sugar of 70-99 mg/dL. If fasting blood sugar is 100-125 mg/dL, follow-up by a health care provider within one month as you may have pre-diabetes. If fasting blood sugar is 126 mg/dL or above, follow-up by a health care provider within one week as you may have diabetes. If greater than 300 mg/dL, then call your doctor or health care provider for instructions.
- Random Blood Glucose _____mg/dL [] Normal [] Follow-up needed. (Food last consumed ____ hours before testing). If random blood sugar is 140-199 mg/dL, you may have impaired glucose tolerance or diabetes depending on when and how much you ate at your last meal. We suggest you recheck after you've fasted for 8 hours and see your health care provider within 2-4 weeks. If random plasma blood sugar is 200 mg/dL or greater, your risk of diabetes is high, so you need to follow-up with your doctor/health care provider within 1 week. If greater than 300 mg/dL, call your doctor/health care provider for instructions.
- Triglycerides _____mg/dL [] Normal [] Follow-up needed. Triglycerides are the main kind of fats in foods. Triglycerides are also created by our bodies. Most fat in our body is stored as triglycerides. When triglycerides are high, lots of fat is in the blood. The goal to lower your chance of heart disease is to have triglycerides lower than 150 mg/dL. If triglycerides are more than 150 mg/dL, see your doctor/health care provider to determine how you can lower your triglycerides. Also, to lower triglycerides, decrease the amount of animal fats in your diet.
- LDL _____mg/dL [] Follow-up needed. LDL carries cholesterol in the blood. High levels of LDL cholesterol are deposited on the artery walls, a condition known as "hardening of the arteries" and can obstruct the flow of blood through the artery—leading to stroke or heart attack. If your LDL is 190 mg/dL or more OR if you have cardiovascular disease or diabetes and your LDL is more than 70 mg/dL, you need to see your doctor/health care provider to determine if you need to lower your LDL. Ask your doctor/health care provider if you need medication to help lower your LDL.
- HDL _____mg/dL [] Normal [] Follow-up needed. HDL is a type of "good" cholesterol in blood that takes cholesterol away from your arteries. High levels of HDL lower chances of heart attack. HDL of greater than 40 mg/dL for men, and 50 mg/dL for women are acceptable but for both, an HDL greater than 60 mg/dL further reduces risk. To increase HDL level, be physically active, lose weight (if overweight) and stop smoking.

Recommendations/Personal Goals to Decrease your Risks of Developing Diabetes: _____

Health Professional: _____ I understand the results and instructions (Participant): _____ (5/15)

Microalbumin Random Urine Screening

Eligible for microalbumin screening:

Persons with diabetes

Persons with hypertension

Exclusion criteria:

Urinary tract infection

History of kidney disease or kidney failure

Hematuria (blood in your urine)

Women who are currently on their menstrual cycle

The health screening event you are participating in today includes a screening test for microalbumin, in addition to the other screenings provided (blood pressure, height, weight, BMI, waist circumference, A1C, glucose, and cholesterol (total cholesterol, triglycerides, LDL, & HDL). I consent to the screenings provided (including microalbumin screening). I understand that a urine sample will be obtained for the microalbumin screening. I also understand that there is a possibility of a false-positive or false-negative result. I know these tests are voluntary and without compensation, expectation or promise thereof and consent to be tested, and hereby hold Medical University of South Carolina, the Diabetes Initiative of South Carolina, participating licensed health professionals, their agencies and employees harmless for all claims and actions in connection therewith. I agree to follow-up with a health care provider if tests are abnormal. I give permission to contact me and/or my doctor for follow-up.

Name: _____

Signature of Participant: _____

Date: _____

Study Title: Physical Activity and Cardiometabolic Risk Factors among African American
Women Residing in the Southeastern United States

Study # 1: Secondary Analysis
Protocol

Medical University of South Carolina

PI: Felicia Jenkins, MSN, RN Mentor:
Gayenell Magwood, PhD, RN

Specific Aims

Aim 1: Determine the levels of PA reported and examine the relationships between PA levels and self-reported 1) diabetes, 2) weight (BMI), 3) hypertension, and 4) hyperlipidemia among a sample of AAW participating in REACH Risk Factor Surveys (2001 – 2012). Hypothesis: PA level will be associated with prevalence of CMR (diabetes, obesity, hypertension, and hyperlipidemia).

Sub-Aim1.1. Examine the relationships between smoking status and self-reported 1) diabetes, 2) weight (BMI), 3) hypertension, and 4) hyperlipidemia

Sub-Aim1.2. Examine the relationships between fruit and vegetable consumption and self-reported 1) diabetes, 2) weight (BMI), 3) hypertension, and 4) hyperlipidemia

Significance

A.1. Cardiovascular disease, diabetes, and other chronic health conditions are leading causes of morbidity and mortality; AAW have higher rates when compared to other ethnic/gender groups (Centers for Disease Control and Prevention, 2013; Heron, 2013). AAW have a higher rate of hypertension and a higher mortality rate from cardiovascular disease and diabetes (Office of Minority Health [OMH], 2014). Hypertension, diabetes, and hyperlipidemia are cardiometabolic risk (CMR) factors. CMR factors are associated with cardiovascular disease (R. E. Lee, Mama, & Lopez Iii, 2012). Additional CMR factors include obesity and lifestyle factors such as smoking, physical inactivity and unhealthy eating habits. Unhealthy eating habits, such as a diet that is not rich in fruits and vegetables, are important considerations for chronic disease prevention (August & Sorkin, 2010). African Americans typically do not consume enough fruits and vegetables (Backman et al., 2011; Scarinci et al.). The daily recommendations for fruit and vegetable intake are: 1) 2.5 cups of vegetables per day for women ages 19 – 50, 2) 2 cups of vegetables per day for women ages 51 and over, 3) 2 cups of fruit per day for women ages 19 – 30, and 4) 1.5 cups of fruit per day for women ages 31 and over (United States Department of Agriculture [USDA], n.d.). In addition to health disparities for chronic health conditions, AAW have higher rates of obesity and physical inactivity, risk factors associated with these chronic health conditions. AAW are 80% more likely to be obese than Non-Hispanic White women. According to an analysis of 2009 data for Charleston and Georgetown counties, 48.9% of AAW were obese compared to 30.8% of African American men (Liao et al., 2011). Like obesity, physical inactivity contributes to morbidity and mortality. Lifestyle behaviors, such as PA, are essential for health promotion and disease prevention. PA refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2014). Physical inactivity will refer to individuals who do not meet PA guidelines, while physical activity or physically active will refer to those who are meeting PA guidelines. Current PA guidelines advise 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity each week in addition to at least two days of strength-conditioning (Centers for Disease Control and Prevention [CDC], 2011). Moderate-

intensity refers to activities that cause a slight to moderate increase in breathing or heart rate (example: brisk walking), and vigorous- intensity refers to activities that cause a large increase in breathing or heart rate (example: running). Although Healthy People 2020 indicates that more than 80% of U.S. adults do not meet PA guidelines, AAW have an even higher rate of physical inactivity (Go et al., 2014; S. H. Lee & Im, 2010). Previous studies have reported inconsistent findings regarding PA's influence on CMR. Several studies have reported significant results (Carr et al., 2008; Wilson, Porter, Parker, & Kilpatrick, 2005; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001; Young et al., 2014). Nonsignificant findings for PA and CMR factors have been reported as well (Keyserling et al., 2002; Peterson et al., 2014; Stephens, Kirby, Buckworth, Devor, & Hamlin, 2007; Wilder, Grandjean, Schuessler, & Hendricks, 2011). Studies examining the association of PA and CMR have not included AAW (Carr et al., 2008) or included AAW without reporting results by race (Peterson et al., 2014; Young et al., 2014). This study will specifically examine PA levels and CMR risk factors for AAW living in Charleston and Georgetown counties, one of the 40 REACH community coalitions nationwide. This study has the potential to contribute to scientific knowledge and clinical practice by providing data regarding the association of PA and CMR factors. Additionally, this study will provide data regarding the levels of PA for AAW in two southern communities. This secondary analysis provides the opportunity to answer new research questions with existing data. Future studies will be conducted in other geographic areas.

A.2. Physical inactivity is a risk factor for several chronic health conditions including but not limited to stroke and cardiovascular disease (Centers for Disease Control and Prevention [CDC], 2011; Eckel et al., 2014). This study will provide significant contributions to the current state of science regarding the levels of PA and the association of PA levels and CMR factors among AAW, an understudied population. This study will be beneficial for future researchers and health educators promoting PA or other interventions to reduce CMR within this specific population.

A.3. Results from this study may be used by future studies focusing on reducing CMR, including studies that may focus on promoting PA in AAW. Additionally, this study will provide essential information and has the potential to contribute to future studies and have an impact on population health. Reducing health conditions such as heart disease and diabetes and increasing PA are major public health goals.

Preliminary Studies

Not applicable.

Research Design and Methods

Design Overview

The proposed research will examine PA levels and the association between PA levels and specific CMR factors. Smoking status and fruit/vegetable consumption will be examined as well. Further, the relationship between these lifestyle factors and the CMR factors will be examined. PA level will refer to whether or not PA guidelines are met. Smoking status will refer to a self-report of whether or not the participant smokes. Fruit and vegetable consumption will be self-reported and will refer to whether or not dietary guidelines for fruit and vegetables are met. To accomplish the aims of this proposal, a secondary analysis approach will be used. The secondary analysis of REACH (2010) and REACH (U.S.) data will be performed to examine PA levels and CMR factors in a sample of AAW in two southern communities. Secondary analysis of existing data may be conducted to answer new research questions (Smith et al., 2011). SPSS version 22.0 will be used for data analysis.

Aim 1: Determine the levels of PA reported and examine the relationships between PA levels and self-reported 1) diabetes, 2) weight, 3) hypertension, and 4) hyperlipidemia among a sample of AAW participating in REACH Risk Factor Surveys (2001 – 2012).

Introduction. Limited research examining the association of PA and CMR for AAW is available. The *objective* of this aim is to determine the association of PA and self-reported CMR factors among a sample of AAW and determine PA levels within this same population. To achieve this aim, we will test the working *hypothesis* that there will be associations between PA levels and one or more CMR factors (diabetes, obesity, hypertension, and hyperlipidemia). Examining existing REACH Risk Factor survey data for a sample of AAW living in two southern counties, this study also will examine reported PA levels from 2001 to 2012. A secondary analysis using existing data from REACH (2010) and REACH (U.S.) Risk Factor surveys will be conducted. The *rationale* for this aim is that successful completion of the proposed research will add to the current knowledge base regarding PA levels for southern AAW and associations between PA level and CMR factors. Sub-Aims focus on additional lifestyle behaviors such as smoking status and fruit/vegetable consumption.

Research Design. For aim #1, a secondary data analysis of REACH (2010) and REACH (U.S.) Risk Factor Survey data will be performed to determine reported levels of PA and if associations exist between PA level and CMR factors. Specifically, CMR factors, including, hypertension, hyperlipidemia, obesity and diabetes, will be examined. Smoking status and fruit/vegetable consumption will be examined as well. This work is secondary data analysis that will use existing data to answer new research questions. This secondary analysis of an existing dataset provides access to large sample sizes (Smith et al., 2011) and will begin once IRB approval is received from the Medical University of South Carolina (MUSC).

Variables

The secondary analysis includes self-reported data from the REACH (2010) and REACH (U.S.) Risk Factor surveys. PA refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2014). This secondary data analysis will examine self-reported PA categorized as moderate and vigorous. Moderate-intensity PA refers to activities that cause a small increase in breathing or heart rate (examples: brisk walking, vacuuming, and gardening) and vigorous - intensity PA refers to activities that cause a large increase in breathing or heart rate (examples: running, aerobics, and heavy yard work). Participants self-reported the number of days and the number of minutes per day participating in both moderate and vigorous PA. For the purposes of this study, 150 minutes of moderate- intensity or 75 minutes of vigorous-intensity aerobic activity each week (Centers for Disease Control and Prevention [CDC], 2011) will be used as the guideline for meeting PA. Physically inactive individuals will refer to those who are not meeting these guidelines. Physically active will refer to those who are meeting PA guidelines. Participants also self-reported CMR factors including blood glucose, blood pressure, blood lipids (cholesterol), and weight. For the purposes of this study, elevated blood glucose refers to the patient self-reporting a history of diabetes. Hypertension refers to a self-reported history of high blood pressure. Hyperlipidemia refers to a self-report of high cholesterol. Weight, as well as height, was self-reported by participants. To obtain data regarding obesity, this study will utilize the Centers for Disease Control and Prevention (2011) recommended calculation for BMI: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$. BMI will be reported as normal weight, overweight, and obese. Smoking status and consumption of fruits and vegetables are self-reported as well. Smoking status refers to whether or not participants are current smokers. Fruit and vegetable consumption is self-reported. United States Department of Agriculture (USDA) guidelines will be used to determine whether or not participants meet recommendations for fruit and vegetable consumption.

Participants, Setting, Eligibility, and Recruitment

REACH data previously collected across nine years from samples of AAW living in Charleston and Georgetown counties will be used for the secondary analysis. African American adults were the targeted population. Participant eligibility included females aged 40 – 64 and household members aged 18 or older. This analysis will include 4160 female participants from REACH (2010) and REACH (U.S.) Risk Factor surveys. Participant eligibility for the secondary analysis will include AAW. Further, participants who reported a response for survey items pertaining to moderate or vigorous PA will be included in the sample.

Measures and Data Source

REACH data previously collected from AAW living in Charleston and Georgetown counties will be analyzed using SPSS statistical software version 22.0. Additionally, the researcher will analyze demographic data provided by participants, including age, educational level, and employment status. REACH Risk Factor surveys were developed as part of the Racial and Ethnic Approaches to Community Health (REACH), a program established by the Centers for Disease Control and Prevention. Administered annually, the REACH Risk Factor surveys are the largest community-based survey focusing on minority populations in the United States (Liao et al., 2004). The REACH Risk Factor survey were administered in minority communities to focus on various health issues including but not limited to heart disease, diabetes, and obesity. REACH Risk Factor surveys are self-report questionnaires that include questions regarding health status, health-care access, self-reported height and weight, fruit and vegetable intake, PA, cigarette smoking, and awareness of various health issues including diabetes, hypertension, cholesterol, and cardiovascular disease (Liao et al., 2004). The surveys have been administered by in-person interviews, questionnaire mailings, and telephone interviews using random digit dialing (RDD) or a combination of RDD and listed telephone numbers (Liao et al., 2011). REACH (2010) Risk Factor surveys for Charleston and Georgetown counties were administered by using RDD and listed telephone numbers. Advance respondent letters were mailed to sampled households to increase the response rate. REACH (2010) Risk Factor year 5 used a stratified sampling design of listed and unlisted numbers. Due to the sampling methods, sampling weights were added to reduce the potential for bias. Response rates for years 1 to 5 were 67.2%, 57.7%, 56%, 56%, and 41%, respectively. REACH (U.S.) Risk Factor survey utilized telephone interviews and mailed questionnaires for each year.

For years 1 to 4, telephone interview response rates were higher than the response rate for mailed questionnaires. In-person interviews were used for year 1 of REACH (U.S.) Risk Factor survey, with a response rate of 55%. Address-based sampling design was used for REACH (U.S.) Risk Factor surveys to reduce the potential coverage bias associated with RDD. REACH (U.S.) Risk Factor survey applied a base weight for each sampled address that reflected the probability of selection. Further, the number of eligible members and the number selected at the sampled address were also weighted. Age and gender weights were adjusted so the sample would be representative of the community in terms of age-gender. Telephone interviews for REACH (2010) and REACH (U.S.) Risk Factor surveys were conducted with AAW and household members over the age of 18. Trained interviewers conducted interview sessions. The time frame for questionnaire administration was 15 minutes for REACH (2010) and 17 minutes for REACH (U.S.) Risk Factor survey.

Expected Outcomes: The secondary analysis will provide results that contribute to the current state of knowledge regarding the reported levels of PA in this population and the association of PA level and self-reported 1) diabetes, 2) weight (BMI), 3) hypertension, and 4) hyperlipidemia. Furthermore, data regarding 1) smoking status, and 2) fruit and vegetable consumption for AAW and the relationship of these behaviors to the CMR factors will be provided.

Potential Problems and Alternative Strategies: As a doctoral student, the primary investigator may have a potential problem with appropriately analyzing data. The primary investigator will work with expert scientists to complete the secondary analysis.

Data Entry and Management

The secondary analysis will include previously collected, de-identified data that will not require data entry. Data will be stored in a file on the MUSC server that is accessible by authorized persons with a username and password. During data analysis, data will be stored on a password-protected computer. The de-identified data will be uploaded into SPSS 22.0 for analysis.

Statistical Analysis

A total of nine datasets are combined into one dataset. Using a variable named ‘year’, each year of the dataset may be analyzed separately or the dataset may be analyzed as a whole. SPSS version 22.0 will be used to analyze data for the secondary analysis. Descriptive statistics will be performed for demographic variables and CMR variables (i.e. smoking, fruit and vegetable consumption, physical activity, self-report of diabetes, hypertension, weight, and hyperlipidemia). To examine the relationship between PA and the CMR factors, bivariate correlations, multivariate correlations, and regression analysis will be performed.

Protection of Human Subjects

The secondary analysis of REACH 2010 and REACH US Risk Factor survey data will begin upon receiving IRB approval for not human research. The secondary analysis will include previously collected, de-identified participant data. The PI did not have any interaction with individuals participating in the REACH Risk Factor surveys. Further, the data files do not include any information that would allow the PI to identify participants.

Inclusion/Exclusion Criteria

Inclusion	Exclusion
Gender: Female	
Self-identify as African American/Black	Does not self-identify as African American/Black
Provided a response for questions related to moderate or vigorous physical activity	

Table 1.

Sources of Materials

REACH Risk Factor survey data

Adequacy of Protection Against Risks

Due to the nature of the study, a secondary analysis using de-identified data from the REACH Risk Factor surveys, there are no foreseen risks.

Potential Benefits of the Proposed Research to Human Subjects and Others

This study will have no direct benefit to the participants. This study will examine PA levels of African American women in two southern communities. Specifically, it will examine reported PA levels and whether or not there is a relationship between PA levels and self-reported 1) diabetes, 2) weight, 3) hypertension, and 4) hyperlipidemia. The results provided by this study will provide data regarding PA levels in this specific population, an understudied population. Results may be utilized by health educators and researchers focusing on promoting PA and decreasing health disparities associated with physical inactivity. Although there is no direct benefit to participants, the results may inform future research and health promotion programs focusing on PA.

Importance of Knowledge to be Gained

This study will provide valuable data regarding PA levels for this specific population and the association of PA level and CMR. Results from the study may be used by health educators and researchers. Furthermore, clinicians including doctors, nurses, and other healthcare providers may use the information to assess PA levels and CMR for AAW.

Inclusion of Women and Minorities

This study includes AAW.

Inclusion of Children

Children will not be included because the population being studied is AAW.

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Study Title: Physical Activity and Cardiometabolic Risk among African American
Women residing in Southeastern United States: A Feasibility Study

PI: Felicia Jenkins, MSN, RN

Dissertation Study # 2

Medical University of South Carolina

Specific Aims

Aim 1: Determine the levels of PA reported and examine the levels of CMR factors (1) glucose, 2) weight (BMI) & waist circumference, 3) BP, 4) lipids, 5) smoking, and 6) fruit and vegetable consumption reported among a sample of AAW in Upstate, South Carolina).

Aim 2: Evaluate the feasibility, acceptability, implementation of community-based screening, and linkage to primary care for CMR and using a modified REACH Risk Factor Survey.

Significance

A.1. Cardiovascular disease, diabetes, and other chronic health conditions are leading causes of morbidity and mortality; AAW have higher rates when compared to other ethnic/gender groups (Centers for Disease Control and Prevention, 2013; Heron, 2013). AAW have a higher rate of hypertension and a higher mortality rate from cardiovascular disease and diabetes (Office of Minority Health [OMH], 2014). Hypertension, diabetes, and hyperlipidemia are cardiometabolic risk (CMR) factors. CMR factors are associated with cardiovascular disease (R. E. Lee, Mama, & Lopez Iii, 2012). Further, these CMR factors are also criteria for diagnosing metabolic syndrome. Metabolic syndrome refers to a clustering of factors such as abdominal obesity, decreased HDL and an increased level of triglycerides, blood pressure, and fasting glucose (National Heart Lung and Blood Institute, 2011). Albumin levels have also been associated with metabolic syndrome and cardiovascular disease (Klausen, Parving, Scharling, & Jensen, 2007). Additional CMR factors include obesity and lifestyle factors such as smoking, physical inactivity and unhealthy eating habits. Unhealthy eating habits, such as a diet that is not rich in fruits and vegetables, contribute to chronic health conditions. Lifestyle behaviors such as a healthy diet are important for chronic disease prevention (August & Sorkin, 2010). African Americans typically do not consume enough fruits and vegetables (Backman et al., 2011; Scarinci et al.). The daily recommendations for fruit and vegetable intake are: 1) 2.5 cups of vegetables per day for women ages 19 – 50, 2) 2 cups of vegetables per day for women ages 51 and over, 3) 2 cups of fruit per day for women ages 19 – 30, and 4) 1.5 cups of fruit per day for women ages 31 and over (United States Department of Agriculture [USDA], n.d.). In addition to health disparities for chronic health conditions, AAW have higher rates of obesity and physical inactivity, risk factors associated with these chronic health conditions. AAW are 80% more likely to be obese than non-Hispanic White women. According to an analysis of 2009 data for Charleston and Georgetown counties, 48.9% of AAW were obese compared to 30.8% of African American men (Liao et al., 2011). Like obesity, physical inactivity contributes to morbidity and mortality. Lifestyle behaviors, such as PA, are essential for health promotion and disease prevention. PA refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2014). Physical inactivity will be used to indicate individuals who do not meet PA guidelines, while physical activity or physically active will be used for those who are meeting PA guidelines. Current PA guidelines advise 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity each week in addition to at least two days of strength-conditioning (Centers for Disease Control and Prevention [CDC], 2011). Physical activity intensity level is often measured using

metabolic equivalents (METs). METs refer to the energy expended while the body is resting (Bushman & American College of Sports Medicine, 2015). METs are used to express the energy expenditure of an activity. Intensity levels are categorized as light, moderate, and vigorous. Light-intensity refers to activities that do not increase your heart rate and the intensity levels are below 3.0 METs (example: walking at a casual pace). Moderate-intensity refers to activities that cause a slight to moderate increase in breathing or heart rate (example: brisk walking), and vigorous-intensity refers to activities that cause a large increase in breathing or heart rate and are greater than 6.0 METs (example: running). It is important to note that intensity level may vary based on an individual's fitness level. For example, brisk walking may be moderate-intensity for a healthy adult while a casual walk may be moderate-intensity for an unfit individual (Aadahl, Kjaer, & Jørgensen, 2007). Although Healthy People 2020 indicates that more than 80% of U.S. adults do not meet PA guidelines, AAW have an even higher rate of physical inactivity (Go et al., 2014; S. H. Lee & Im, 2010). Previous studies have reported inconsistent findings regarding PA's influence on CMR. Several studies have reported significant results (Carr et al., 2008; Wilson, Porter, Parker, & Kilpatrick, 2005; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001; Young et al., 2014). Nonsignificant findings for PA and CMR factors have been reported as well (Keyserling et al., 2002; Peterson, Snih, Stoddard, McClain, & Lee, 2014; Stephens, Kirby, Buckworth, Devor, & Hamlin, 2007; Wilder, Grandjean, Schuessler, & Hendricks, 2011). Studies examining the association of PA and CMR have not included AAW (Carr et al., 2008) or included AAW without reporting results by race (Peterson et al., 2014; Young et al., 2014). This study will examine PA levels and CMR factors for AAW living in Upstate, South Carolina, an area not covered by REACH Risk Factor survey datasets. This study has the potential to contribute to scientific knowledge and clinical practice by providing data regarding the association of PA and CMR factors.

A.2. Physical inactivity is a risk factor for several chronic health conditions including but not limited to stroke and cardiovascular disease (Centers for Disease Control and Prevention [CDC], 2011; Eckel et al., 2014). This study will provide significant contributions to the current state of science regarding the levels of PA and CMR factors among AAW, an understudied population. Further, this study will provide data that will be useful for planning future community-based health screenings. This study will be beneficial for future researchers and health educators promoting PA or other interventions to reduce CMR within this specific population.

Preliminary Studies

Not applicable

Research Design and Methods

Design Overview

The proposed research will examine PA levels and specific CMR factors. Smoking status and fruit/vegetable consumption will be examined as well. Further, this study will examine microalbumin levels. PA level will refer to whether or not PA guidelines are met. Smoking status will refer to a self-report of whether or not the participant smokes. Fruit and vegetable consumption will be self-reported and will refer to whether or not dietary guidelines for fruit and vegetables are met. This feasibility study will examine PA levels and CMR among a sample of AAW in Upstate, South Carolina. A convenience sample of AAW participating in a health screening event will be recruited. The feasibility study will include both self-report and objective measures that are obtained from health screening records. Objective measures will include height/weight, waist circumference, BMI, blood pressure, fasting glucose, A1C, albumin, and lipids. This study will examine the feasibility, acceptability, and implementation of CMR screening in this population. Further, the use of a modified REACH Risk Factor survey will be examined. SPSS version 22.0 will be used for data analysis.

Aim 1: Determine the levels of PA reported and examine the levels of CMR factors: 1) glucose, 2) weight (BMI) & waist circumference, 3) BP, 4) lipids, 5) smoking, and 6) fruit and vegetable consumption reported among a sample of AAW in Upstate, South Carolina).

Rationale. AAW have the highest rate of physical inactivity compared to other ethnic/gender groups. Further, AAW have a higher rate of obesity and death from diabetes and cardiovascular disease. Chronic health conditions have several factors including but not limited to lifestyle behaviors such as physical inactivity, smoking, and unhealthy eating habits. In addition to CMR, these factors contribute to an individual's risk of metabolic syndrome. Increased albumin levels are another factor associated with metabolic syndrome. The *objective* of this aim is to answer the following research questions: 1. What are the reported levels of PA? 2. What are the levels of CMR factors among AAW in Upstate, South Carolina? The *rationale* for this aim is that successful completion of the proposed research will contribute to the current state of the science. Specifically, the completion of aim 1 will provide previously unavailable data for a region in Upstate, South Carolina. As a result of this study, data regarding levels of PA s and CMR will be available for this population. This study also will examine urine albumin levels.

Research Design. To address aim #1, a feasibility study will be conducted to examine reported PA levels and CMR factors including 1) glucose, 2) weight (BMI), 3) BP, 4) lipids, 5) smoking, and 6) fruit and vegetable consumption among AAW living in the Upstate. Upon obtaining approval through MUSC's IRB, recruitment for study participants will begin. This study may provide data for future studies examining PA level and CMR and studies promoting PA in this population.

Variables

This feasibility study will include self-reported data for PA, fruit and vegetable consumption, smoking status, history of hypertension, history of diabetes, and history of hyperlipidemia. PA refers to “any bodily movement produced by skeletal muscles that requires energy expenditure” (World Health Organization [WHO], 2014). Moderate- intensity PA refers to activities that cause a small increase in breathing or heart rate (examples: brisk walking, vacuuming, and gardening) and vigorous - intensity PA refers to activities that cause a large increase in breathing or heart rate (examples: running, aerobics, and heavy yard work). Participants will self-report the number of days and the number of minutes per day participating in both moderate and vigorous PA. For the purposes of this study, 150 minutes of moderate-intensity or 75 minutes of vigorous- intensity aerobic activity each week (Centers for Disease Control and Prevention [CDC], 2011) will be used as the guideline for meeting PA. Physically inactive individuals will refer to those who are not meeting these guidelines. Physically active will refer to those who are meeting PA guidelines. Participants will also self-report a history of CMR factors including blood glucose, blood pressure, blood lipids (cholesterol). Elevated blood glucose refers to the patient self-reporting a history of diabetes. Hypertension refers to a self-reported history of high blood pressure. Hyperlipidemia refers to a self-reported history of high cholesterol. Smoking status and consumption of fruits and vegetables are self-reported as well. Smoking status refers to whether or not participants are current smokers. Fruit and vegetable consumption is self-reported. United States Department of Agriculture (USDA) guidelines will be used to determine whether or not participants meet recommendations for fruit and vegetable consumption.

Objective measures obtained from health screening records will include blood pressure, fasting blood glucose, A1C, height, weight, waist circumference, BMI, blood lipids, and urine microalbumin. The specific CMR factors or variables include hypertension, obesity, increased glucose, and hyperlipidemia. Hypertension, or elevated blood pressure, refers to a systolic blood pressure of 140 mm/Hg or higher or a diastolic blood pressure of 90 mm/Hg or higher (American Heart Association, 2015c). Elevated blood glucose will refer to a fasting blood glucose ≥ 100 mg/dl, a random blood glucose ≥ 140 mg/dl, or an A1C $> 5.7\%$ (American Diabetes Association, 2015). The Centers for Disease Control and Prevention guidelines for overweight and obesity will be used. Overweight will refer to a BMI of 25.0 to 29.9 and obesity will refer to a BMI of 30 or higher (Centers for Disease Control and Prevention, 2012). An increased waist circumference will refer to measures greater than 35cm (measured at the umbilicus) for women. Blood lipids (cholesterol) will include total cholesterol, low-density lipoproteins (LDL), high-density lipoproteins (HDL) and triglycerides. Hyperlipidemia refers to elevated lipids (cholesterol and triglyceride levels). Elevated total cholesterol refers to levels ≥ 200 mg/dl, elevated LDL refers to levels ≥ 190 mg/dl (≥ 70 mg/dl for persons with a history of heart disease), and elevated triglycerides refer to levels ≥ 150 mg/dl (American Heart Association, 2015a; Stone et al., 2013). HDL cholesterol is recommended to be ≥ 50 mg/dl for women. Microalbuminuria will refer to an elevated microalbumin level. Metabolic syndrome criteria will include increased waist circumference, increased triglycerides, increased glucose, increased blood pressure, and reduced HDL (American Heart Association, 2015b; National Heart Lung and Blood Institute,

2011). Increased albumin levels will be included as metabolic syndrome criteria as well (Grundy, Brewer, Cleeman, Smith, & Lenfant, 2004).

Participants, Setting, Eligibility, and Recruitment

A convenience sample of AAW, age ≥ 21 , will be recruited to participate. The principal investigator will recruit 60 AAW who are participating in the CMR health screening events held at Mt. Ararat First Pentecostal Church, Gaffney Senior Center, and Dunton United Methodist church. All health screening sites are located in Gaffney, South Carolina. The events at Mt. Ararat and Dunton United will be open to church members as well as individuals from the community. The event held at the Senior Center will be open to the community. Eligibility criteria are noted in **Table 1**. Health screening participants who meet eligibility criteria and consent to participate will be enrolled in the study. Health screening participants consenting to participate will have their modified REACH Risk Factor survey, health screening participant evaluation survey, and results of their health screenings used for research. Health screenings will include blood pressure, fasting blood glucose, A1C, height, weight, waist circumference, BMI, blood lipids, and microalbumin.

Intervention

1. Recruit and consent African American women who are participating in the community health screening
2. Collect participants' data from health screening records, modified REACH Risk Factor survey, and evaluation form.
3. Enter data into REDCap.
4. Analyze, interpret, and report data.

Measures and Data Sources

This study will include the use of the modified REACH Risk Factor survey results for consenting participants. This study will also collect participant data from the health screening records. Participants consenting for the study will also have their participant evaluation survey (satisfaction survey) analyzed. This study will allow the primary investigator to evaluate participant recruitment from the health screening, time and resources, and the health screening process.

Expected Outcomes: This will be the first known study examining PA levels and CMR risk among a sample of AAW living in Upstate, South Carolina. It is expected that the study will provide information regarding the feasibility of recruiting participants in Upstate, South Carolina.

Aim 2: Evaluate the feasibility, acceptability, implementation of community-based screening, and linkage to primary care for CMR and using a modified REACH Risk Factor Survey.

Rationale. To our knowledge, PA and CMR data are not available for all counties in Upstate, South Carolina. To examine PA levels and CMR factors among a sample of AAW, a feasibility study will be conducted. The *objective* of this aim is to answer the following research question: What is the feasibility of CMR screening, participant recruitment, and lifestyle assessment using a modified version of the REACH Risk Factor survey among a sample of AAW in Upstate, South Carolina? Specific CMR factors to be examined include nutrition (specifically fruit and vegetable consumption), smoking status, blood pressure, weight/BMI/waist circumference, glucose level, and lipids. These CMR factors (increased waist circumference, increased glucose, increased blood pressure, increased triglycerides, and lowered HDL) are also criteria for metabolic syndrome diagnosis. This study will also include microalbumin results. Previous research indicates that microalbumin levels are associated with metabolic syndrome (Klausen et al., 2007). This study will also examine the use of a self-administered, modified REACH Risk Factor survey. Further, the feasibility, acceptability, and implementation of a CMR health screening will be examined.

Design. This feasibility study will examine the use of a modified version of the REACH Risk Factor survey. Further, the feasibility, acceptability, implementation of community-based screening, and linkage to primary care for CMR will be evaluated. The purpose of a feasibility study is to assess the potential for successfully implementing the main study (Tickle-Degnen, 2013). This feasibility study will provide data regarding the potential for recruitment, the acceptability, and implementation of CMR health screening. Further, feasibility studies may be used to establish community partnerships (Bowen et al., 2009). To evaluate the feasibility of recruitment, acceptability, and implementation of the health screening, a process evaluation will be conducted. Process evaluations allow the opportunity to evaluate program activities (Substance Abuse and Mental Health Services Administration, n.d.).

Measures and Data Sources: The primary investigator will maintain a record of the recruitment process. The primary investigator will maintain a record of the number of health screening participants recruited, how many agreed to participate, and how participants learned about the health screening event. Further, the primary investigator will use the evaluation forms for consenting participants to evaluate acceptability of the screening and the screening process. The evaluation form will also be used to evaluate participants' acceptability regarding completing the modified REACH Risk Factor survey.

Expected Outcomes: Findings from this study will be used for future, larger studies examining PA level and CMR among AAW in Upstate, South Carolina.

Potential Problems and Alternative Strategies: Recruiting participants for the feasibility study is a potential problem. Recruiting participants from the health screening event is a

recruitment strategy. Further, the CMR health screening will be held at a convenient location and time (Wallace & Bartlett, 2013). Two of the events will be held on a Saturday at local churches and one event will be held at a local community center.

Data Entry and Management

Data obtained from the feasibility study will be entered into REDCap by the primary investigator and accessible by members of the research team (ie. primary investigator and co-investigators only) with a username and password. REDCap is a secure, web application available through the Biomedical Informatics Center at MUSC. Double data entry with at least 24 hours between data entry sessions will be used to reduce data entry errors (Melnik & Morrison-Beedy, 2012). Data from both data entry sessions will be examined, and any discrepancies will be reconciled. Double data entry is an option available through REDCap (Harris et al.) REDCap allows data to be downloaded into common statistical packages (i.e. SPSS). Further, REDCap maintains an audit trail for data entry and export procedures. Documents from the feasibility study including consent forms, HIPAA forms, surveys, and health screening results will be securely stored in a locked file cabinet inside a locked office.

Statistical Analysis

Data for the feasibility study will be entered into REDCap by the primary investigator. Data will be reviewed and cleaned to ensure accuracy with data entry and determine whether or not data are missing. SPSS version 22.0 will be used to analyze data. Descriptive statistics will be performed for demographic variables and CMR variables (i.e. smoking, fruit and vegetable consumption, physical activity, self-report of diabetes, hypertension, weight, and hyperlipidemia). The feasibility study also will include variables for the objective measures (i.e. glucose, A1C, lipids, urine microalbumin, blood pressure, height, weight, waist circumference, and BMI). Independent t-tests will be performed to determine if there is a difference among participants meeting metabolic syndrome criteria and those not meeting metabolic syndrome criteria. Pending sample size and the number of participants meeting or not meeting metabolic syndrome criteria, non-parametric tests such as the Mann-Whitney may be used.

Protection of Human Subjects

Overview: IRB approval will be obtained prior to any research being conducted. Participant recruitment for the feasibility study will begin after receiving IRB approval for an expedited study. Health screening data and survey results for consenting participants will be used for research purposes. The feasibility study will require all participants to complete the consent process and receive information regarding the study and any potential risks and benefits prior to participating in the study. Participants will be informed of their right to refuse to participate, their right to withdraw from the study at any time, and their right to confidentiality. Participants will receive an identification number for data collection (i.e., REACH Risk Factor survey, participant evaluation, and objective measures). The identification number will be

used to match the participants' REACH Risk Factor survey with their objective measures. Data from the feasibility study will be entered into the REDCap web application maintained by MUSC. The hard copies of all protected health information and surveys will be maintained in a locked file cabinet, located in a locked office, with only the primary investigator (PI) having access.

Inclusion/Exclusion Criteria

Inclusion	
Gender: Female	
Self-identify as African American/Black	
Age: ≥ 21	
Willingness to consent	
Resident of Cherokee or Union county	

Table 1.

Adequacy of Protection Against Risks

All participants will complete the consent process and receive information regarding the study and any potential risks and benefits. To prevent the loss of confidentiality of participants' personal information, all study documents will be maintained in a secure location.

Potential Benefits of the Proposed Research to Human Subjects and Others

This study will have no direct benefit to the participants. This study will examine levels of PA and CMR among a sample of African American women in Upstate, South Carolina. The results provided by this study will provide data regarding CMR and PA levels in this specific population, an understudied population. Results may be utilized by health educators and researchers focusing on promoting PA and decreasing health disparities associated with physical inactivity. Although there is no direct benefit to participants the results may inform future research and health promotion programs focusing on PA.

Importance of Knowledge to be Gained

This study will provide valuable data regarding levels of PA and CMR for this specific population. Results from the study may be used by health educators and researchers. Furthermore, clinicians including doctors, nurses, and other healthcare providers may use the information to assess PA levels and CMR for AAW.

Inclusion of Women and Minorities

This study will be open to AAW, the population of focus for this study.

Inclusion of Children

Participants less than 21 years of age are excluded from the feasibility study. Children will not be included because the population being studied is AAW.

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Facilities

The community-based health screenings will be held at the following locations: Mt.

Ararat First Pentecostal Church, a local church located in Gaffney, South

Carolina (Cherokee county).

Dunton United Methodist Church, a local church located in Gaffney, South Carolina. Gaffney

Senior Center, a local senior center utilized by Gaffney residents

Modified Version of the REACH U.S. Risk Factor Survey

Acknowledgements: REACH U.S. Charleston and Georgetown Diabetes Coalition and local community partners for the use of the REACH U.S. Risk Factor Survey. The REACH Charleston and Georgetown Diabetes Coalition is funded by a Center's for Disease Control and Prevention (CDC) grant

REACH U.S. - Modified Version

This is a modified version of the REACH U.S. Household Member Interview previously used by the Centers for Disease Control and Prevention. Completing this booklet is part of a health screening examining health issues in your area. Taking part is up to you. You do not have to answer any question you do not want to and you can stop at any time. The original booklet takes 15 to 17 minutes and this modified version is expected to take less than 15 minutes. Your answers will be kept secure and private. If you would like to participate, please answer the questions in this booklet using a pen with blue or black ink. When you are finished return your booklet to the designated personnel.

Instructions for completing the REACH U.S. Booklet

This booklet contains several types of questions. Each question should be answered only about yourself.

- For some questions, you answer the question by marking a box, like this:
 - ☐ Yes
 - ☐ No
- For some questions, you answer the question by filling in one number per box, like this:

 NUMBER OF DAYS
- You will sometimes be instructed to skip one or more questions. In this example, if your choice is 'No', you skip to question 10; otherwise, you continue to the next question.
 - ☐ Yes
 - ☐ No ➡ Skip Question 9. Go To Question 10

SECTION A

1. Would you say that in general your health is:
 - ☐ Excellent
 - ☐ Very good
 - ☐ Good
 - ☐ Fair
 - ☐ Poor

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good? **If none, enter 0.**

NUMBER OF DAYS

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? **If none, enter 0.**

NUMBER OF DAYS

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation? **If none, enter 0.**

NUMBER OF DAYS

5. Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare or Indian Health Services?

- ☐ Yes
- ☐ No

6. Was there a time during the last 12 months when you needed to see a doctor, but could not because of the cost?

- ☐ Yes
- ☐ No

7. About how long has it been since you last visited a doctor for a routine checkup?
A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.
- ☐ Within the past year (anytime less than 12 months ago)
 - ☐ Within the past 2 years (1 year but less than 2 years ago)
 - ☐ Within the past 5 years (2 years but less than 5 years ago)
 - ☐ 5 or more years ago
 - ☐ Never
8. Are you currently ...? Mark only one.
- ☐ Employed for wages Go To Question 9
 - ☐ Self-employed Go To Question 9
 - ☐ Out of work for more than 1 year..... Skip Question 9, go to Question 10
 - ☐ Out of work for less than 1 year..... Skip Question 9, go to Question 10
 - ☐ A Homemaker..... Skip Question 9, go to Question 10
 - ☐ A Student..... Skip Question 9, go to Question 10
 - ☐ Retired Skip Question 9, go to Question 10
 - ☐ Unable to work..... Skip Question 9, go to Question 10
9. When you are at work, which of the following best describes what you do? *Mark only one. If you have more than one job, please include all jobs in your answer.*
- ☐ Mostly sitting or standing
 - ☐ Mostly walking
 - ☐ Mostly heavy labor or physically demanding work
10. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
- ☐ Yes
 - ☐ No

SECTION B

We are interested in two types of physical activity – vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate.

11. Now thinking about the moderate activities you do when you are not working in a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate?

☐ Yes

☐ No ➡ If No, skip Questions 12 and 13. Go to Question 14

12. How many days per week do you do these moderate activities for at least 10 minutes at a time?

DAYS PER WEEK

13. On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

MINUTES PER DAY

14. Now thinking about the vigorous activities you do when you are not working in a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

☐ Yes

☐ No ➡ If No, skip Questions 15 and 16. Go to Section C (Question 17)

15. How many days per week do you do these vigorous activities for at least 10 minutes at a time?

DAYS PER WEEK

16. On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

MINUTES PER DAY

SECTION C

These next questions are about the foods you usually eat or drink. Include all foods you eat, both at home and away from home. Enter a number in the 'number of times' box and then mark if it is times per day per week or per year. If never, enter '0'.

		Per	Per	Per	Per
		Day	Week	Month	Year
	NUMBER OF TIMES				
		<i>Mark only one.</i>			
17. How often do you drink fruit juices such as orange, grapefruit, or tomato?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Not counting juice, how often do you eat fruit?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. How often do you eat green salad?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. How often do you eat potatoes not including French fries, fried potatoes, or potato chips?.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. How often do you eat carrots?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Not counting carrots, potatoes, or salad, how many servings of vegetables do you usually eat? <i>(Example: A serving of vegetables at both lunch and dinner would be two servings.)</i>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION D

The next questions are about diabetes.

23. Have you ever been told by a doctor that you have diabetes?

☐ Yes

If you are male → go to Question 25
If you are female → go to Question 24

☐ No

☐ No, pre-diabetes or borderline diabetes

If No, skip Questions 24, 25, 26, 27, 28, 29, 30, and 31. Go to Section E (Question 32)

24. Was this only when you were pregnant?

☐ Yes → If Yes, skip Questions 25, 26, 27, 28, 29, 30 and 31. Go to Section E (Question 32)

☐ No

25. About how often do you check your blood for glucose or sugar? *Include times when checked by a family member or friend but do not include times when checked by a health professional. If never, enter '0'.*

NUMBER OF TIMES

Per day

Per Week

Per Month

Per Year

Mark only one.

☐
☐
☐
☐

26. About how often do you check your feet for any sores or irritations? *Include times when checked by a family member or friend, but do not include times when checked by a health professional. If never, enter "0".*

NUMBER OF TIMES

Per day

Per Week

Per Month

Per Year

Mark only one.

☐
☐
☐
☐

27. About how many times in the past 12 months have you seen a doctor, nurse, or other health professional for your diabetes? If never, enter "0".

NUMBER OF TIMES

28. A test for "A one C" measures the average level of blood sugar over the past three months. About how many times in the past 12 months has a doctor, nurse, or other health professional checked you for "A one C"? *If never, enter "0".*

NUMBER OF TIMES

OR ☐ Mark here if you have never had an 'A one C' test.

29. About how many times in the past 12 months has a health professional checked your feet for any sores or irritations? *If never, enter "0".*

NUMBER OF TIMES

OR ☐ Mark here if your feet have been amputated.

30. When was the last time you had an eye exam in which your pupils were dilated? This would have made you temporarily sensitive to bright light.

- ☐ Within the past month
(anytime less than 1 month ago)
- ☐ Within the past year
(1 month but less than 12 months ago)
- ☐ Within the past 2 years
(1 year but less than 2 years ago)
- ☐ 2 or more years ago
- ☐ Never

31. Have you taken a course or class in how to manage your diabetes yourself?

- ☐ Yes
- ☐ No

SECTION E

The next questions are about high blood pressure.

32. Have you been told by a doctor, nurse, or other health professional that you have high blood pressure?
- ☐ Yes
 - ☐ No ➡ If No, skip Questions 33 and 34. Go to Section F
 - ☐ Told borderline or pre-hypertensive ➡ Skip Question 33 and 34. Go to Section F
33. Are you currently taking medicine for your high blood pressure?
- ☐ Yes
 - ☐ No
34. Are you now doing any of the following to help lower or control your high blood pressure?
- a. changing your eating habits?
 - ☐ Yes
 - ☐ No
 - b. cutting down on salt?
 - ☐ Yes
 - ☐ No
 - ☐ Do not use salt
 - c. reducing alcohol use?
 - ☐ Yes
 - ☐ No
 - ☐ Do not drink
 - d. exercising?
 - ☐ Yes
 - ☐ No

SECTION F

The next questions are about blood cholesterol.

35. Blood cholesterol is a fatty substance found in the blood. Have you ever had your blood cholesterol checked?

- ☐ Yes
- ☐ No ➡ If No, skip Questions 36 and 37. Go to Section G (Question 38)

36. About how long has it been since you last had your blood cholesterol checked?

- ☐ Within the past year
(anytime less than 12 months ago)
- ☐ Within the past 2 years
(1 year but less than 2 years ago)
- ☐ Within the past 5 years
(2 years but less than 5 years ago)
- ☐ 5 or more years ago

37. Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?

- ☐ Yes
- ☐ No

SECTION G

The next few questions are about cardiovascular disease.

38. Has a doctor, nurse, or other health professional ever told you that you had any of the following?

a. a heart attack, also called a myocardial infarction

- ☐ Yes
- ☐ No
- ☐ Not sure

- b. angina or coronary
heart disease

☐ Yes
☐ No
☐ Not sure

- c. a stroke

☐ Yes
☐ No
☐ Not sure

39. Which of the following do you think is a symptom of a heart attack?

- a. Pain or discomfort in the jaw, neck or back

☐ Yes
☐ No
☐ Not Sure

- b. Feeling weak, lightheaded, or faint

☐ Yes
☐ No
☐ Not Sure

- c. Chest pain or discomfort

☐ Yes
☐ No
☐ Not Sure

- d. Sudden trouble seeing in one or both eyes

☐ Yes
☐ No
☐ Not Sure

- e. Pain or discomfort in the arms or shoulder

☐ Yes
☐ No
☐ Not Sure

f. Shortness of breath

- ☐ Yes
- ☐ No
- ☐ Not Sure

40. Which of the following do you think is a symptom of a stroke?

a. Sudden confusion or trouble speaking

- ☐ Yes
- ☐ No
- ☐ Not Sure

b. Sudden numbness or weakness of face, arm, or leg, especially on one side

- ☐ Yes
- ☐ No
- ☐ Not Sure

c. Sudden trouble seeing in one or both eyes

- ☐ Yes
- ☐ No
- ☐ Not Sure

d. Sudden chest pain or discomfort

- ☐ Yes
- ☐ No
- ☐ Not Sure

e. Sudden trouble walking, dizziness, or loss of balance

- ☐ Yes
- ☐ No
- ☐ Not Sure

f. Severe headache with no known cause

- ☐ Yes
- ☐ No
- ☐ Not Sure

41. If you thought someone was having a heart attack or stroke, what is the first thing you would do?

- ☐ Take them to the hospital
- ☐ Tell them to call their doctor
- ☐ Call 911
- ☐ Call their spouse or a family member
- ☐ Do something else

SECTION H

The next questions are about breast and cervical cancer screening. Only women should answer these questions. If you are male, go to Section I

42. A mammogram is an x-ray of each breast to look for breast cancer. Have you ever had a mammogram?

- ☐ Yes
- ☐ No ➡ If No, skip Question 43. Go to Question 44

43. How long has it been since you had your last mammogram?

- ☐ Within the past year
(any time less than 12 months ago)
- ☐ Within the past 2 years
(1 year but less than 2 years ago)
- ☐ Within the past 3 years
(2 years but less than 3 years ago)
- ☐ Within the past 5 years
(3 years but less than 5 years)
- ☐ 5 or more years ago

44. A clinical breast exam is when a doctor, nurse, or other health professional feels the breast for lumps. Have you ever had a clinical breast exam?

- ☐ Yes
- ☐ No ➡ If No, skip Question 45. Go to Question 46

45. How long has it been since your last breast exam?

- ☐ Within the past year
(any time less than 12 months ago)
- ☐ Within the past 2 years
(1 year but less than 2 years ago)
- ☐ Within the past 3 years
(2 years but less than 3 years ago)
- ☐ Within the past 5 years
(3 years but less than 5 years)
- ☐ 5 or more years ago

46. A Pap test is a test for cancer of the cervix. Have you ever had a Pap test?

- ☐ Yes
- ☐ No ➡ If No, skip Question 47. Go to Question 48

47. How long has it been since you had your last Pap test?

- ☐ Within the past year
(any time less than 12 months ago)
- ☐ Within the past 2 years
(1 year but less than 2 years ago)
- ☐ Within the past 3 years
(2 years but less than 3 years ago)
- ☐ Within the past 5 years
(3 years but less than 5 years)
- ☐ 5 or more years ago

48. Have you had a hysterectomy? A hysterectomy is an operation to remove the uterus (womb).

- ☐ Yes
- ☐ No

SECTION I

The next questions are about cigarette smoking.

49. Have you smoked at least 100 cigarettes (5 packs) in your entire life?

- ☐ Yes
- ☐ No ➡ If No, skip Questions 50 and 51. Go To Section J (Question 52)

50. Do you now smoke cigarettes everyday, some days, or not at all?

- ☐ Everyday
- ☐ Some days
- ☐ Not at all ➡ If No, skip Questions 50 and 51. Go To Section J (Question 52)

51. During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?

- ☐ Yes
- ☐ No

SECTION J

The next questions are about you.

52. What is the highest grade or year of school you completed?

- ☐ Never attended school or only attended kindergarten
- ☐ Grades 1 through 8 (Elementary)
- ☐ Grades 9 through 11 (Some high school)
- ☐ Grade 12 or GED (High school graduate)
- ☐ College 1 year to 3 years (Some college or technical school)
- ☐ College 4 years or more (College graduate)

SECTION K

These next questions are about your daily life.

53. Do you own or rent your home?

- ☐ Own
- ☐ Rent
- ☐ Other Arrangement (such as a group home or staying with friends or family without paying rent) ➡ If No, skip Question 54. Go to Question 55

54. How often in the past 12 months would you say you were worried or stressed about having enough money to pay your rent/mortgage?

- ☐ Always
- ☐ Usually
- ☐ Sometimes
- ☐ Rarely
- ☐ Never
- ☐ Not Applicable (Do not pay rent/mortgage)

55. How often in the past 12 months would you say you were worried or stressed about having enough money to buy nutritious meals?

- ☐ Always
- ☐ Usually
- ☐ Sometimes
- ☐ Rarely
- ☐ Never
- ☐ Not Applicable (Do not buy food)

56. Is your annual household income from all sources.....?

- ☐ Less than \$10,000
- ☐ \$10,000 to less than \$15,000
- ☐ \$15,000 to less than \$20,000
- ☐ \$20,000 to less than \$25,000
- ☐ \$25,000 to less than \$35,000
- ☐ \$35,000 to less than \$ 50,000
- ☐ \$50, 000 to less than \$75,000
- ☐ \$75,000 or more

Participant Evaluation Form

Thank you for participating in the health screening and health survey. Please take a moment to provide feedback regarding your experience. Please rate your experience using the following Strongly Agree = SA, Agree = A, Disagree = D, and Strongly Disagree = SD. Please circle your response.

	1. Strongly Agree	2. Agree	3. Disagree	4. Strongly Disagree
1. I am satisfied with the types of screenings provided.	SA	A	D	SD
2. I am satisfied with the amount of time the health screening took.	SA	A	D	SD
3. I am satisfied with the amount of time to complete the REACH survey.	SA	A	D	SD
4. My screening results were explained to me.	SA	A	D	SD
5. I felt comfortable asking questions.	SA	A	D	SD
6. I understand my health screening results.	SA	A	D	SD
7. I would participate in future health screenings.	SA	A	D	SD
8. Overall, I was satisfied with my health screening experience.	SA	A	D	SD



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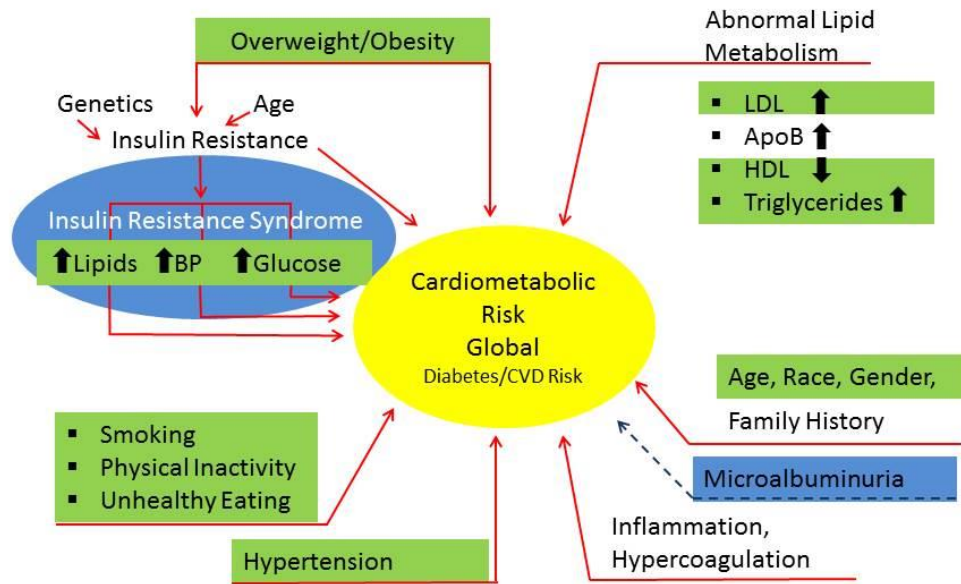
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Modified CMR model - American Diabetes Association, 2007